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The Story of the Salton Sea.

SINCE the evil day when the land of Chaldea was irretrievably ruined by the sudden diversion of the Tigris,* the world has seen no such remarkable example of a great river deserting its permanent ancient bed and cutting out a new channel at right angles to its former course as the recent outbreak of the Colorado River on the southern border of California.

The attendant circumstances and the actual effects of the ancient disaster differed widely from those connected with the recent outbreak of the Colorado. In the former case natural forces alone appear to have been the cause of an event that cut off supplies of water from the plain of Shinar, and turned that flourishing region into a desert. Attempts were made to repair the disaster, but without avail, and the ruin wrought remains to this day. In the case of the Colorado River, the improvidence of man was clearly the originating cause. The river was directly encouraged to desert its course and to inundate a vast tract of cultivated land, instead of following its natural channel down to the Gulf of California; but happily, after many unsuccessful attempts, the breach has been closed, so restoring the river to its former bed, and opening the way for the ultimate reclamation of the submerged area. In order that our readers may be able to appreciate in an adequate manner the nature of the remarkable and difficult engineering feat that has been accomplished, it is necessary that we should state briefly some facts concerning the physical geography of the Colorado River and the extensive depression, known as the Salton basin, into which its entire flow was unintentionally diverted two years ago.

Rising in the Rocky Mountains, the Colorado River has a total length of more than 2,000 miles, and discharges a muddy stream into the Gulf of California, passing for the last eighty or ninety miles of its course through Mexican territory. Although not generally regarded as one of the great rivers of America, the Colorado actually drains an area equal to nearly one-fifth that of the United States, a fact which is sufficient to indicate that the task of dealing with its recent outbreak was one of considerable magnitude. Having passed through the mountainous regions in the upper part of its course, and the celebrated gorges of the Grand Cañon, the river arrives at Yuma, beyond this town its course being entirely through alluvial soil brought down by the stream in past ages.

The river is largely fed by the melted snows of the Rocky Mountains, and its *régime* is extremely variable. In January it is usually low, about May it begins to rise, and the maximum flood is attained between June 20 and July 15. There is an enormous difference between the minimum and the maximum flow, the discharge varying from 2,600 cubic ft. per second to as much as 120,000 cubic ft. per second, or nearly half the flood discharge of the Nile at Assuan in an average year. The quantity of silt carried by the Colorado in a single year is sufficient to cover an area of 100 square miles to the depth of 6 in., and it is said that the river has been known to raise the bottom of its bed by as much as 7 ft. after a single flood.

A short distance above Yuma (see Fig. 1) the Colorado receives the river Gila, a stream that is nearly dry in the ordinary way, but in times when snow is melting on the mountains its discharge reaches some 100,000 cubic ft. per second. Moreover, as the Gila traverses a region visited by violent rain-storms in all seasons of the year, the Colorado is liable to floods that may increase the discharge below Yuma to upwards of 250,000 cubic ft. per second, or about the same quantity as that discharged per second by the Nile at Assuan in an average year of flood.

It is believed that at a remote geological period the Gulf of California extended far more towards the north-west than it does in the present day; and that the vast quantities of sand and silt brought down by the Colorado River gradually formed a delta, which, by connecting the eastern and western shores, isolated a lagoon at the upper end of the ancient Gulf of California, and built up the valley of Yuma to its present elevation of about 100 ft. above sea level. For a long time the river continued to flow into this lagoon, which at first was in communication with the sea. Afterwards it became

* The *Builder*, Vol. lxxxv., p. 285.

entirely separated by a bank formed by material carried down by the Colorado, whose waters were then diverted towards the open gulf. Thenceforward the lagoon received water only from the Alamo and New rivers and other unimportant streams, and became a great fresh-water lake. These rivers were really only flood channels and were not always able to discharge water as far as the lagoon, which gradually diminished in area by evaporation, until it became one of those areas known locally as a "sink," where the water discharged by rivers sinks into the arid soil and is rapidly evaporated by the intense heat of the sun.

Thus came into existence the depression, some 287 ft. below sea level, indicated on maps as the bed of the Salton Sea, and termed in the United States the Salton Sink. Until recent events this was one of the deepest hollows in the world not filled by water, and according to meteorological records the area is a serious rival to the desert of Sahara in respect of heat and lack of rainfall.

Fig. 1 is a plan showing the lower part of the Colorado River, the shore line of the ancient lagoon, and the present extent of the newly-formed Salton Sea, covering an area of about 400 square miles.

The Imperial Valley indicated on this plan is from 60 ft. to 70 ft. below mean sea level. There is a regular fall towards the depressed area from the Colorado River which, like many other silt-laden rivers, has raised itself above the surrounding country, until at the present time the total difference of level between the river and the bottom of the Salton basin is nearly 400 ft.

It is not known precisely to what causes the ancient diversion of the Colorado River to the south is to be attributed. The Salton basin is in the zone of least resistance of the earth's crust which exists on the borders of the Pacific, between North and South America. The lines of rupture are in continuation of those indicated by earth tremors in San Francisco, and it is by no means improbable that the course of the river was modified in former times by seismic effects. As in all regions where such phenomena are pronounced, there are in the district to which we refer traces of slow and long-continued movements of the earth which in themselves are sufficient to account for the altered course of the river. For instance, the eastern shore of the ancient lagoon is now some 20 ft. higher than the western shore, and on the same side the land has risen as a whole above the former level, thus constituting the terrace or bench known as the Imperial Valley.

Except above and for a short distance below Yuma, the ridge separating the river from the depressed area is not clearly defined. In the district termed Las Lagunas the land is flat and marshy, the waters having no marked tendency to flow either one way or the other. When the river is in flood the waters passing along the western bank flow over the marshes, and afford almost the only source of supply to the Rio Paredones, the Rio Pescadore, and the Hardy Colorado. Bearing in mind these facts and the manner in which the Colorado has raised its bed by the continued deposition of silt, it is not difficult to understand that in time of flood the river would be able without difficulty to cut a new channel through the alluvial soil to the modern head of the Gulf of California. At the same time, as events have proved, there was only a slight but sufficient obstacle to the flow of the river in the direction of the Salton Basin. That obstacle, as we shall presently show, was removed by an ill-advised and only too successful attempt to bring water for irrigation purposes into the low-lying area.

Fig. 1.

Notwithstanding the unpromising aspect of the Salton basin, the soil itself is of particularly fertile character. It is in fact a deep layer of rich silt brought down in ages past by the Colorado River, and as the heat of the sun in the basin is said to attain the temperature of 170° Fahr., there is no lack of encouragement for vegetation, providing adequate water supplies are forthcoming. In 1891, Mr. C. R. Rockwood, an American civil engineer, formulated a scheme for irrigating a portion of the Imperial Valley, but lack of capital prevented the execution of the project. In 1896, the California Development Company was incorporated for the purpose of introducing irrigation into the valley. This company resolved to utilise the dry channel of the Alamo River for the conveyance of water from a point on the Colorado River, about twelve miles below Yuma, to the borders of the Imperial Valley, a distance of about fifty miles. This channel, once a natural flood water overflow, required little more than a connexion with the Colorado River, and works at the point selected for the distribution of water to the area chosen for irrigation. It was afterwards designated the Imperial Canal, and from 1905 to the beginning of 1907 it was the bed of the Colorado River. In the year 1900, an intake canal provided with a head regulator was cut in the United States at the foot of Pilot Knob. (See Fig. 1.) The water drawn from the river in California passed across the International boundary, entering the Alamo channel in Mexico, and finally re-entering the United States.

The first intake rapidly became silted up, and a second cut was made, this time in Mexican territory. (See Fig. 2.) In each case the water passed through a main canal, which, after following a course parallel to the river for about 4½ miles, turned to the west and entered the Alamo channel. Distribution canals, with the necessary regulating works, were provided at the distance of about one mile beyond the International frontier for the irrigation of the area selected for cultivation, and below that point the Alamo channel was simply used as an overflow.

Contracts were made for the supply of water with the owners of cultivable land, in the course of two or three years the wonderful fertility of the land began to attract settlers, and before long the desert had been transformed into a prosperous agricultural district, with a population of some 10,000 persons. The wheat harvest in 1904 was so great that the traffic of the station established by the Southern Pacific Railroad came next in importance after that of Los Angeles and San Pedro. The success of the venture increased at such a rate that very soon the irrigation company were unable to furnish the supplies of water promised, a state of things largely due to the fact that the second intake, like the first, also became silted up. Despite continual dredging the amount of silt brought

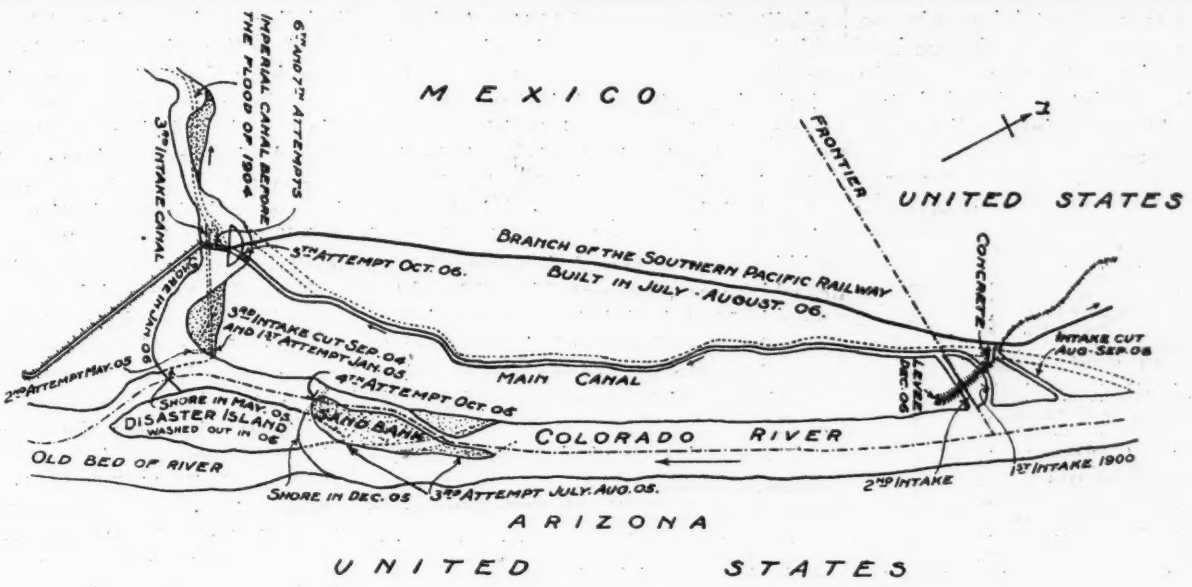


Fig. 2.

down by the river could not be kept under, and the company were obliged to undertake the cutting of a third intake.

It was decided finally, without waiting for permission from the Mexican Government, to cut the new canal from a point about four miles below the two former intakes so as to tap the Colorado at a ower level, and thus to furnish supplies at all seasons of the year. This work was executed in haste and without any precautions, and contrary to the advice of the Mexican Public Works engineers, who only heard that the work had been undertaken when it was too late to interfere. Why these officials were so badly informed on a matter of such importance, and why they did not insist upon the establishment of safeguards after they found the intake had been cut in an improper manner, we do not know, and fear there must be a considerable amount of laxity in the administration of the service in question. The new intake appears to have been simply a breach in the river bank, without regulating works of any kind, forming the head of a canal 50 ft. wide by 11 ft. deep. Work was commenced in September, 1904, and finished in the course of the ensuing month. The river was then low, and everything seemed satisfactory. Soon the bed of the canal became enlarged by the scouring action of the water. At first this caused no alarm, and the company rather congratulated themselves that the river was doing useful constructional work gratis. After a time, however, came the summer floods, the banks were cut away, the canal was so deepened that it became a ravine, and the gap in the river bank widened more and more, giving passage to a volume of water so enormous that it could not be utilised in the valley below. Finally, the Colorado River bodily deserted its former bed, poured down the Alamo channel, burst across the country from that watercourse to the New River bed, cutting through the towns of Mexicala and Calexico, wrecking the railway, and streaming down the Imperial Valley to form once more an immense inland sea. The old channel of the Colorado was then left bare and some eighty miles of its estuary without water.*

* To be concluded in our next issue.

MEDIÆVAL CHURCH PLANNING IN ENGLAND.—IV.

BY FRANCIS BOND, HON.A.R.I.B.A.

Churches of the Cistercian Monks.

AT this point we may leave the cathedral churches and the greater churches generally of the monastic orders and examine separately the churches of those religious orders whose planning is more or less peculiar and characteristic. The most important are the churches of the Cistercians.

The famous order of the Cistercians was an off-shoot of the Cluniac order, just as that was an off-shoot of the Benedictine. It was a Puritanical reaction alike against Cluniac ritualism and Benedictine learning. The order was founded in 1098 by Abbot Robert, who came from Cluny; its first house was in the woods of Burgundy, at Cîteaux, or Cisteaux. But its rapid and immense success was mainly due to St. Bernard, who entered the order in 1113. He was the first spiritual power of the time, greater than Popes and Kings, the greatest man in Western Christendom. Within fifty years of its foundation the order numbered 500 abbeys in Europe. So rapid was the multiplication of Cistercian abbeys that a statute was promulgated in 1152 forbidding the foundation of more abbeys—a rule subsequently broken frequently. By the middle of the XIIIth century there were 1,800 Cistercian abbeys, the majority of which were founded in the XIIth century. The daughter-churches of Cîteaux were four, viz., Clairvaux la Ferté, Pontigny, Clairvaux, and Morimond; all four were founded between 1113 and 1115. These in turn sent out colonies, each of which remained dependent in a large measure on the mother-church. The first colonies in each country were as follows:—

Western France, Cadouin, 1119; Germany, Alten Kamp, 1123; England, Waverley, 1128; Italy, Fossanova, 1135; Portugal, Toronca, 1140; Spain, Mousalud, 1141; Sweden, Alvastra and Nydala, 1143.

In the Cistercian churches of Burgundy five types occur. The earliest is the plan with three parallel eastern apses. This may have been the plan of the first church at Cîteaux; it occurs at Vaux-de-Cernay. In England it is seen in the Benedictine abbey of St. Mary, York, the Cluniac priory of Castle Acre, and elsewhere, but not in any Cistercian church. Another is the normal Cistercian plan, but with unaisled *apsidal* presbytery; of this also we have no example in England. It was the plan of the second church of Morimond. The other three types are all represented in England. The earliest in England and by far the most common is that with short aisleless presbytery, as at Kirkstall (Fig. 24), and originally as at Fountains (Fig. 10), and Dore (Fig. 8). The transept has one, two, or three

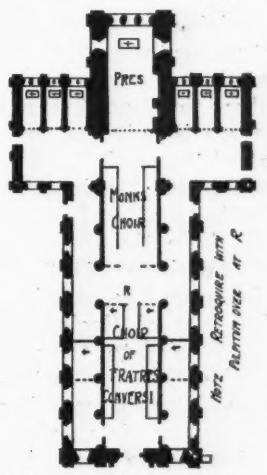


Fig. 24. Kirkstall Abbey.

rectangular chapels on the east side of each arm, which are separated from one another by solid walls. This is the most common plan throughout Europe, and may well be the plan of the second church built by St. Bernard at Clairvaux in 1135. Before 1150 it was common in Southern and Western France, and in the monasteries founded by St. Bernard in Italy. Examples in France are Fontenay, Noirlac, the two Vaux-de-Cernay, Hauterive; in Italy, Fossanova, Casamiri; Chiaravalle, near Milan, and Chiaravalle, near Ancona; in Spain, Santas Creus; in Germany, Maulbronn, Eberbach, and Arnsbourg; in Denmark, Sorö; in Sweden, Alvastra; in Norway, Hövedö.

In England it appears in the very first church built by the Cistercians, that of Waverley, Surrey, founded 1128, which Mr. Harold Brakspear has proved to have been a church with aisleless nave and aisleless rectangular presbytery,

O

and with a transept containing only one chapel in each arm. Mr. Brakspear is of opinion that this was the plan also of the first church of Tintern, founded two years later. The following is a list of the chief examples :—

	Number of Chapels in each Arm of the Transept.
Waverley, Surrey (1st church)—founded 1128	1
Tintern (1st church)—founded 1131	1
Quarre, Isle of Wight—founded 1131	3
Calder, Cumberland—founded 1134	2
Fountains (1st church)—founded *c.* 1135	2
Louth, Lincolnshire—1139	3
Dore, Hereford (1st church)—founded 1147	2
Buildwas, Salop—*c.* 1148	2
Furness, Lancashire—soon after 1148	3
Kirkstall, Yorks—1152	3
Roche, Yorks—*c.* 1165	2
Bindon, Dorset—1172	2
Cleeve, Somerset—founded 1188	2
Strata Florida, Cardigan—1166–1203	3
Valle Crucis, Denbigh—*c.* 1200	2
Basingwerk, Flint—*c.* 1225	2
Sallay, or Sawley, Yorks (1st church)	2

The second type of English Cistercian plan appears at :—

Byland—*c.* 1170—three arches from presbytery, five chapels.
Waverley (2nd church)—1203—three arches from presbytery, five chapels.
Hayles (1st church)—1246–1251—three arches from presbytery, five chapels.

In all three the presbytery has full-length aisles on either side, and at the back of the high eastern wall there are five low rectangular chapels, all of the same depth. The high altar was placed, as was proved at Waverley by the foundations of its reredos, one bay west of the east wall of the presbytery. Thus the easternmost bay of the presbytery at once served as a processional aisle and provided access to the eastern chapels. It may be contended that the plan is of English origin; for it appears in the XIth century cathedral of Hereford, except that there the eastern chapels are apsidal and are three, not five, in number, and that there is only one arch in the eastern wall of the presbytery. But this plan appears on the Continent also; and since, as Dehio and Von Bezold surmise, it may have been the plan of the first church of Pontigny (1113-1115), we cannot insist on an English origin for it.

The third type of English Cistercian plan is closely allied to the second, the difference being that the eastern extension is deepened so as to contain not only the row of eastern rectangular chapels, but west of them the processional aisle, which in churches of the second type had been west of the east wall of the presbytery. At Dore, where this arrangement survives intact (except for the loss of the low walls between the little chapels), each chapel had originally its own separate gable roof. We have but two examples :—

Dore—*c.* 1200—three arches from the presbytery, five chapels.
Fountains (2nd church)—1210–1247—one arch from the presbytery, nine chapels.

The Chapel of the Nine Altars at Fountains, which was copied a few years later in the Benedictine cathedral of Durham, is but an extension of the Dore ambulatory and eastern chapels two bays further to the north and two bays further to the south, so as to give nine instead of five chapels. The temptation is strong to ascribe an English origin to this plan. For long before Dore was set out it occurs in the church of the Benedictine nuns at Romsey; and it was the plan adopted in Hereford Cathedral by the Secular canons, 1186-1199. Probably the Benedictine abbey of Glastonbury had a similar termination when rebuilt after the fire of 1184. And after this it became the favourite plan for the greater churches throughout the West of England as well as at Winchester, Southwark, St. Albans, and Salisbury. On the other hand, this plan is precisely that of a Cistercian church in the Sketch Book of Villard de Honnecourt; and of Cistercian churches such as Ebrach and Riddagshausen, the choir of the former of which was consecrated in 1178 and the nave in 1186, both before Dore choir was remodelled. Moreover it is supposed to have been the plan of the first church of Pontigny, which was not remodelled till *c.* 1180.

The fourth type of plan appears at :—

Croxden, Stafford—said to be *c.* 1190.
Beaulieu, Hants—Founded 1204—church hallowed 1246.
Hayles, Gloucester—remodelled 1270–1277.

All three have a semicircular aisle encircling a semicircular apse, and from the ambulatory radiate five small apsidal chapels. For the last two churches reference should be made to the valuable monographs by Mr. Harold Brakspear. The plan of Beaulieu is exceptionally continental throughout. The periapsidal plan had gone out of fashion in England after the middle of the XIIth century, with one or two exceptions. All the three Cistercian examples are doubtless derived from Pontigny as it was remodelled *c.* 1180 and as it still exists. Similar to Pontigny was the plan of the third church at Clairvaux, which was consecrated by the Bishop of Langres in 1174. Clairvaux, again, may be regarded as an expansion and improvement of the Burgundian Cathedral of Langres, which probably dates between 1150 and 1175. This magnificent plan occurs here and there in the greater Cistercian churches throughout Europe, *e.g.*, Maestricht, Heisterbach, Veruela.

The fifth type of plan is beyond question English. It is the plan of the aisled parallelogram, which produced the vast eastern limbs of Kirkham, Lincoln, Ely, York, St. Paul's. It was especially common in the North of England.

Cistercian examples are :—

	Bays in Eastern Limb.
Jervaulx—*c.* 1180	4
Rievaulx—*c.* 1230	7
Netley—1239	4
Neath—*c.* 1240	4
Tintern—1269	4

And *Sallay*, whose presbytery was probably remodelled in the XVth century. With the exception of the churches in this group, it is, on the whole, likely that all the Cistercian plans in England were drawn from one or other of the mother-churches in Burgundy. One reason for this is that the daughter-abbeys of the Cistercian churches were not independent of one another like those of the Benedictines. All were founded subject to a periodical and strict visitation carried out directly from or on behalf of the mother-abbey. Thus from first to last there was kept up a regular intercourse and communication with Continental architecture, which in the case of the English Benedictines did not exist. Moreover, the Cistercians were constrained, far more than any other order, to manual labour. Instead of study, as with Benedictines and Cluniacs, they were enjoined manual labour. This, we know, often took the form of manual labour in putting up their own monastic buildings and churches. They worked so much with their own hands at building, especially the *fratres conversi*, that they must have known far more about planning and building construction than Benedictines or Cluniacs; and no doubt frequently learnt to take a genuine interest and pleasure in the operations of building. We hear of "*conversi barbati diversis artibus periti*" being lent to abbeys about to build. St. Bernard is recorded as sending Frater Achard, master of the novices at Clairvaux, to many French and German abbeys in order to direct the erection of their buildings. In Italy the first Cistercian abbey, Fossanova, between Rome and Capua, rebuilt 1187-1208, is thoroughly Burgundian; no Italian architect could have designed it. The next Cistercian church built in Italy was Casamiri, which is also Burgundian. The great church of San Galgano, in Tuscany, 1208, is an exact reproduction of that of Casamiri; it was built by Frater Conversus Ugolino di Maffeo, Frater Petrus *operarius*, and Frater Matheus *magister operis lignaminis*. The accounts of Siena Cathedral show that the *operarius* there was Frater Vernaccio in 1259, and in 1260 Frater Conversus Melano, and that both of them were from San Galgano. (*Enlart's Gothique en Italie*, pages 13 and 157.) A chronicle relates that in 1124, Wigbold, the Cistercian abbot of Aduard in the diocese of Groningue, wishing to rebuild his church, sent a lay brother *to sketch the plan and details of Cîteaux*, which he wished to reproduce with the greatest possible exactness. (*Bulletin Monum.*, 1874, page 216.) "At Duns, in Flanders, it is recorded that the Cistercians not only designed but worked at the building of their church." (Prior, *Gothic Art in England*, 141.) "There is evidence that the Abbot of Beaulieu, Hampshire, got from Rouen a certain Durandus, who was a mason there from 1214 to 1254. He was imported, no doubt, to work out the construction of the (polygonal) chevet, which would be strange to an English mason." We may, I think, conclude without hesitation that the planning of all English Cistercian churches built before *c.* 1180, and occasionally even later than that, was based on Burgundian models.*

NOTES.

The Traffic Branch of the Board of Trade.

QUESTIONS asked in the House of Commons last week and in the House of Lords this week have not elicited replies of reassuring character with regard to the new traffic department or to the future intentions of the Government. The answers of Mr. Kearley to the inquiries of Sir J. Dickson-Poynder were particularly nebulous, and while the reply of Lord Granard to the appeal made by Lord Ribblesdale, Lord Montagu of Beaulieu, and the Bishop of Southwark was more lucid, we are unable to find much consolation in it. The statement that the Board of Trade will report to Parliament yearly on the needs of London traffic fully confirms the fear expressed in our "Note" of August 10, that the appointment of the new authority is ominous of further

* To be continued.

delay. There is merely a hope on the part of the Government that the traffic branch will have the co-operation of the Home Office and the Local Government Board, but we have no assurance that these departments will consent to be guided by a subordinate official in another department. Further, it is not made clear that the Board of Trade have statutory powers to examine private bills. The most disconcerting expression in Lord Granard's statement is that he is not in a position to say whether a permanent settlement of the subject will be by means of a Traffic Board. We are really afraid that the elusive answers so far given can only be regarded as justifying the view put forward by Lord Montagu of Beaulieu and Lord Cawdor that the recent action of the Government is simply an attempt to shelve all the great questions that were raised by the report of the Royal Commission.

Extraordinary Traffic.

A RECENT decision of the Courts in the case of Bromley Rural District Council *v.* Croydon Corporation has an important bearing on the recovery of expenses incurred in repairing injury to roads occasioned by extraordinary traffic. The Locomotives Act, 1898, places a time limit within which proceedings for the recovery of such expenses must be taken, viz., within twelve months of the time at which the damage was done, or, where the damage is the consequence of any particular building contract or work extending over a long period, not later than six months after the completion of the contract or work. The defendant Corporation had entered into two contracts for the haulage of stone, to be used for general purposes, between March, 1904, and March, 1905, the plaintiffs issued their writ August 22, 1905, and the question was whether the plaintiffs could recover for the whole damage done during the above contracts, or whether the claim must not be limited to the twelve months preceding the issue of the writ, *i.e.*, from August 22, 1904, to March 31, 1905, when the contracts were completed. The Court held that the work being done under contracts extending over a definite period was "work extending over a long period," within the section, and therefore that the damage done in carrying out the contracts throughout the whole year could be recovered. In the case of Kent County Council *v.* Corporation of Folkestone (the *Builder*, "Notes," March 4, 1905) this section, it will be remembered, was considered and the haulage in that case was of stone required for widening a road; the haulage under the contract ended some ten and a half months before action was brought, though the road widening operations continued some six months longer. The road widening was held to be a distinct operation, and the plaintiff recovered only such damages as were incurred within twelve months of the commencement of the action. In that case, also, it was decided that the provisions of the Locomotives Acts, 1898, did not repeal the provisions of the Public Authorities Protection Act, 1893, which limit the time within which actions against public authorities can be commenced to six months, but it was held that the latter Act had no application where the damage was caused by contractors who were not the servants of the Corporation.

Ludgate Hill Station.

PROBABLY no railway company has spent more money with so little advantage on the construction of terminal stations than the London, Chatham, and Dover Railway. Blackfriars, Ludgate Hill, St. Paul's, and Holborn Viaduct were successively built as termini, and of these the first has been converted into a goods *depôt*, and the second is no longer required for main line traffic. A short time ago the company almost decided to close Ludgate Hill Station altogether, but the preferable conclusion was made in the end to alter it suitably for present conditions. The alterations now in progress, under the supervision of Mr. P. C. Tempest, M.Inst.C.E., comprise the substitution of one island platform of ample size for the two existing platforms, the remodelling of the tracks so that the main line express trains may be able to pass through to St. Paul's or Holborn Viaduct, and the widening of the entrance and exit openings. At the same time the present leaky overhead floor will be made watertight, and a new steel roof will be built over the remodelled station. As all the work must be conducted without causing interruption to traffic, it will be several months before everything can be completed, but judging by the rapid manner in which the reconstruction at Charing Cross was carried out under the direction of the same engineer we may be sure that no time will be wasted.

Landlord and Tenant.

IN leases it is very usual to insert a covenant that the lessee shall not assign the premises without the lessor's consent, which consent "shall not unreasonably be withheld." The covenant is almost common form, but its effect is not always apprehended, and therefore the recent case of Jenkins *v.* Price (current *Law Reports*) should be noted. In the lease of an hotel for a term of fourteen years it was covenanted that the lessee should not assign the premises without the previous consent in writing of the lessor "unless such consent shall be unreasonably withheld." After the lease had run two years the lessee desired to assign the premises to a brewery company. The lessor considering that it would be prejudicial to have the premises tied to a brewery company, consented to the assignment only on condition that the rent should be increased and the term prolonged. The Conveyancing Act, 1892, sect. 3, provides that in all leases containing such a covenant, unless the contrary is in terms expressed in the lease, no fine or sum of money in the nature of a fine shall be payable in respect of the consent to be given, and the court held that the terms imposed constituted a fine. The result of this finding was that it was not reasonable to impose a condition contrary to that which the law implied in the lease, and that consent having been "unreasonably withheld," the lessee under the terms of the lease was free to make the assignment.

Electrical Accidents.

THE Report on "Electrical Accidents," by Mr. G. S. Ram, H.M. Electrical Inspector of Factories, which has just been issued, deserves careful study by all electrical engineers. Mr. Ram does not confine himself to giving a catalogue of the accidents, but makes strong representations as to the way in which the Board of Trade Regulations are broken, more especially in factories and engineering works. The number of accidents in factories in 1906 was 60 per cent. greater than in the previous year, and the number of fatalities had increased from four to eight. The increase is partly due to the fact that the necessity of taking proper precautions is not realised by many employers. They often accept the lowest tender for an electrical installation without appreciating the fact that the price is low because the apparatus is inferior, and is not provided with elementary safeguards. Serious burns have in many cases been caused by the arcing of cheap and flimsy motor switches. The blades of the switches are thin and bent, and so in the not unusual event of the lever of the automatic starting device failing to move back there is a heavy flash when the operator tries to close the switch, and his hand and face are generally badly burned. The thirty-nine accidents which occurred under the heading of "faulty apparatus" occurred, with one or two exceptions, in connexion with the use of portable appliances. One fatal accident occurred with a portable "desk fan," although the pressure was only 200 volts, and another with a portable lamp, the pressure being 230 volts. We agree with Mr. Ram in thinking that the fatalities at these low voltages cannot all be explained on the "weak heart" theory. The post-mortem examinations do not support this view. The dangers from low-pressures are not sufficiently recognised by those who are responsible for electrical installations, and this is probably why the "weak heart" theory is brought forward at every inquest. The danger arises from the path taken by the current through the body and the nature of the contact at the place where it enters and leaves the body.

Radio-Telephony.

MR. W. DUDDELL gave a most interesting lecture on "The Arc and Spark in Radio-Telegraphy" at the recent meeting of the British Association. The method first employed in radio-telegraphy was to utilise the waves which spread out into space with the velocity of light whenever an electric spark occurs between two conductors. In the new method devised by Poulsen we have an electric arc burning in hydrogen or coal-gas and connected with a resonating circuit which sets up an alternating current of very high frequency through the arc, and thus an appreciable amount of power can be radiated into space. The British Post Office has recently succeeded in signalling over a distance of fifteen miles at the rate of seventy words a minute by means of the spark method, and there is no reason why much higher speeds should not be obtained when the waves produced by high frequency arcs are used to carry the signals. The progress made in

tuning the signals is illustrated by the experiments made on the Lodge-Muirhead system at Hythe. At this station signals were received overland from Elmers End, a distance of fifty-eight miles, although the Admiralty station at Dover, distant only nine miles, was sending as powerful signals as possible in order to produce interference. In addition, the ordinary radio-telegraphic messages with the shipping in the Channel were being sent. The latest development in this system of communication is radio-telephony. It is only necessary to make the electric waves vary in the same way as those which produce sound and speech, and include a telephone in the receiving circuit in order to have perfect "wireless" telephony. Such excellent results have already been obtained by this method that it is proposed to equip stations at Oxford and Cambridge for perfecting this application of the Duddell arc.

The French Inland Navigation Congress.

CONSIDERING the attention which has been devoted for many years past in France to inland navigation, it is somewhat surprising that no congress should have been held on the subject until this summer, when representatives from various parts of the country were gathered together at Bordeaux. The reports there presented contain many points of interest meriting consideration by those who desire to witness the revival of inland navigation in Great Britain. M. Mallet discussed the question of co-operation of navigable waterways and railways, arguing that competition between the two systems of transportation is advantageous to both, and stating in support of this view that the brilliant results attained by the *Chemin de fer du Nord* would probably have been less complete and less rapid in the more productive parts of the system if it had not been for the aid rendered by navigation. But the same speaker wisely avoided the advocacy of expenditure by the State except in places where the prospects of traffic were sufficiently satisfactory, and where waterways could be constructed and operated at moderate cost. M. Tavernier, in a report which may justly be characterised as the most noteworthy contribution brought before the congress, considered the best means of securing the support of capital for the improvement of navigable waterways, and advocated the formation of district administrations representing all the interests concerned, and of a central board of control consisting for the greater part of delegates elected by the district administrations. With unhesitating voice, the Bordeaux Congress have affirmed more imperatively than ever the necessity of assuring the future of inland navigation and of removing the imperfections which still remain to impair the usefulness of this means of transport.

About Orgueil Castle, Jersey.

THE Lieutenant-Governor has handed over Mont Orgueil Castle, St. Heliers, to the States of Jersey, as a gift of the King. The ancient fort stands upon a granite rock upon the east side of the island. Mont Orgueil and a part of the island were taken by Mauleverer, seneschal of Normandy, in virtue of a secret compact made with Queen Margaret of Anjou by the King of France that he should supply her with troops in aid of the Lancastrian cause. The inhabitants, under Philip de Carteret, resisted Louis XI.'s authority, and, *temp.* Edward IV., with the assistance of a squadron commanded by Sir Richard Horbiston, recaptured the fortress, and restored the island again to Great Britain. Jersey remained loyal to King Charles I., but in 1651 Sir George Carteret was compelled to surrender Mont Orgueil, Elizabeth Castle, and Fort St. Aubin to Admiral Blake and General Haines on behalf of the Parliament.

The Auction Mart, City.

AS THE directors of the Auction Mart Company have revised the scale of fees for the booking in advance of sale-rooms, for which the demand increases, we may mention that the original mart was erected in Bartholomew-lane, with an additional entrance in Throgmorton-street, after plans and designs by John Walters, in 1808-9. The buildings were opened for the sale by auction of all kinds of real and personal estates, stocks-in-trade, merchandise, wines, pictures, furniture, etc. Immediately over the saloon was a mezzanine floor containing offices entered from an open gallery, above that were the three sale-rooms, and on the second-floor were three rooms for the sale of personal effects.

THE ARCHITECTURAL ASSOCIATION:

ANNUAL EXCURSION.*

THE eastern tower of Wymondham was planned to be central, and evidently was so until the destruction of the eastern limb of the church. The present structure takes the place of the earlier Norman lantern, and was built between the years 1390 and 1409. It is square in its lower portion, but developed into an octagon as soon as it clears the roof by means of internal corbelled squinch arches at the angles on which the four buttresses, placed in the angles of the square, and carried up the sides of the octagonal portion, have their bearing. The material used is dressed stone, in marked contrast with the other portions of the building, which are of flint rubble, save only the great west tower, 142 ft. in height, which is constructed of squared black flints with stone dressings, strings, etc. This western tower was commenced in the year 1445, the peal of bells for use in the parish church (*i.e.*, the portion now remaining) being hung thirty-one years later. As will be noticed from our illustration, there is a very considerable batter to the structure, and at each of the five stages the perimeter of the tower is diminished; this is especially noticeable in the octagonal angle buttresses, the angles of which are enriched with large quirked bead on shaft. Slightly more than halfway up there is a broad band of the flint and stone panelling, which is such a feature of the Norfolk churches.

At the crown two large windows are pierced through each face of the tower, both being included under one label with carved finial and crockets; the tower above finishes off square without any embattled parapet. On the west side is placed the large west door, and above a large window divided into two by a flat stone pier or enlarged mullion, which gives a very curious effect.

The flint rubble of the walls generally is in marked contrast with the wonderful regularity of the work in this tower, and shows numerous traces of various alterations at different periods. To the east of the south aisles two bays of Norman date are imbedded in the wall, and just by the great chancel arch under the tower are remains of another. The plan of the abbey church, built by William D'Albini in the first years of the XIIth century, must have extended considerably eastward of the present building, and in addition we know there were large transepts, north and south aisles, a central lantern tower, and two western ones, and also numerous chapels. Close at hand were the other buildings of the priory. The nave now consists of nine bays of Norman date, with two tiers of arches, the upper portion having formed the triforium originally; above is the clearstory and fine open angel hammer-beam roof, added in 1432-1445, when the piers of the nave arcade were probably cased on account of the additional weight. The aisles are of remarkable width; the north aisle was enlarged in 1432, and is now wider than the nave; it has a very beautiful transitional roof, with finely-carved angels to the hammer-beams. The nice feeling of the period is shown in the two westernmost angels which abut on the end wall of the aisle; both these have their heads turned round to the east in order that the whole face might be visible. The windows here are remarkably varied in character; the first two are pure Decorated work, all the rest, including the large west window, are Perpendicular of various periods of development. The north porch and parvis over belong also to the transitional period, and there is a fine piece of vaulting with delicately carved bosses, the central one representing the coronation of the B.V. Mary, and the others, the Nativity, the Crucifixion, the Resurrection, and the Coming of the Holy Ghost. Curiously enough, this porch is not square with the church, but facing the churchyard gate axial with the path. The south aisle was originally early English, but was subsequently added to and altered in the XVth century. An altar-tomb of terra-cotta, whitewashed, of Italian design, containing the remains of the last Abbot, who was presented to the vicarage in 1530, is extremely interesting, and the font in the north aisle completed the survey made by the members, who repaired to the vicarage, the party having been invited to tea by the Ven. Daniel Collyer, the Vicar; thence, after a few graceful words of thanks by the President, the excursionists proceeded through the quaint, old-fashioned town to the station, noticing on the way the XVIth century half-timbered Green Dragon Inn, with its single dormer in the high-pitched roof, and, further on, the octagonal, one-storied building called "the market cross"—the lower story being open-timbered, and having the date 1617 carved on one of the beams; the whole is covered by a steep-pitched pyramidical roof of plain tiles, with leaded angles terminating in a moulded finial and vane.

This ended the day, and the party returned by train to Norwich in good time for dinner.

Wednesday, August 14.

On Wednesday, they started off at 8.17 to Swaffham, the reputed home of the famous Pedlar, where they found the conveyances waiting for them, and they at once drove on to Oxborough, noticing, as they passed through the large market square, an elegant little Queen Anne building consisting of a shallow dome crowned by a female figure in lead, and supported on a circular entablature and colonnade of eight Doric columns, all being constructed of wood.

After a drive of about an hour and a quarter, they reached Oxborough, and finally approached the Hall by way of the drive, having had just a passing glimpse at the church with its fine tower and spire on the way. The first view of the Hall at the end of the leafy avenue was particularly attractive, the warm tint of the brickwork being in pleasing contrast with the fresh green of the surroundings. The house is one of the few good examples of brick treatment in the county, and was built in the second half of the XVth century by Sir Henry Bedingfield, the family being now represented by the present owner.

The plan is the favourite one of this period, the hollow square, surrounded by a wide moat still filled with water, and with a large open court in the centre. The entrance is on the north-east side, under a large square tower, flanked on either side by two smaller attached octagonal towers, and on the two angles on the courtyard front by two smaller octagonal turrets, all four being carried up some 10 ft. to 15 ft. above the embattled top of the great square tower, which, in its turn, is considerably higher than the ridge of the main building, and is pierced at its base by the wide and lofty entrance archway. Other

* Continued from page 192.

towers occur at irregular intervals on the three remaining sides of the square. The elevations are entirely of brick, with a ½-in. flush mortar joint, and small, wood-burned bricks about 2 in. by 8 in. by 4 in. The window jambs and heads are the same material, but in larger blocks, all moulded and with one pattern for the foliated arched heads, with a small square label over. The chimneys are excellent examples of cut brickwork, with a long, circular shaft capped with an octagonal crenellated top, and are mostly arranged in pairs at the end of a ridge. One pair on the entrance front placed on a gable end has more than half its thickness projecting in front of the wall, and supported by a long and elaborate series of corbellings, just below which is a date stone bearing, in the then newly-adopted Arabic numerals, the date 1482, the four being represented by half an eight.

Another variety of chimney occurs in the crenellated top of the tower, already referred to, where a pair of plain octagonal shafts of about 1 ft. 10 in. side are incorporated with the battlement in the centre of the two opposite sides, finished with a plain chamfer a few inches above the parapet.

The party also visited the interior of this tower, containing the state apartments; and, ascending to the first floor by a wide Jacobean oak staircase, and passing through a passage, with fine XVIth century glass in the small windows, they came to a large room over the main entrance lighted from the courtyard by two oriel windows, and from the north by a large five-light window placed just over the entrance archway; a turret stair in the western projecting tower with a most ingenious barrel-vault in brick which supported the steps in the next turn of the spiral over any given spot. The other small tower contained a little apartment with a recess for a "prie dieu," but the host, by means of a little pressure on the innocent-looking floor, disclosed a centre-hung trap-door, with a small hole leading to a cell beneath, having no other opening of any kind. Two fetters still remained, chained to the wall, but seemingly unnecessary, as escape was impossible if the ponderous door were once swung to.

In the larger room are many objects of interest, chief among which is a bedspread bearing the monogram of Mary Queen of Scots, and worked by her own hand during her stay at Oxborough, this being the room she occupied.

The members also went out on to the flat roof of the tower, and had a nearer view of a most delightful cut lead vane ornamented with *fleur de lys*, the crest of the Bedingfield family.

After lunch at the small village inn near by, they visited the church, the chancel of which is the only part now in use. The date of the building was, it was noticed on the programme, put down as "Early English and Perpendicular," but some were inclined to describe the church as it stands as belonging chiefly to the transitional period, from Decorated to Perpendicular, with later Perpendicular XVth century additions. The nave, divided into six bays and flanked by two aisles, is of average proportions; to the west it is terminated by the base of the tower. This base has large weathered mouldings, similar to those of the external face, but later in date than the rest of the nave; there is also a most curious mould to the arched opening of the west door in this tower which puzzled several members. To the east of the nave is the long chancel with its large five-light, XVth century window; a modern partition separates this part of the church from the nave, and incidentally prevents one seeing the old oak rood-screen. East of the south chapel is the chapel of the Bedingfield family, separated by a XVIth century terra-cotta screen showing strong Italian influence, especially in the arabesques with scrollwork, etc., which occur all over the work. The most curious feature about these two screens—there is another between the chancel and this chantry—is that they are an exact replica of the altar-tomb (mentioned above) at Wymondham, all three being, without doubt, cast from the same mould.

The roof to this chapel is a beautiful single hammer-beam, with piercings and delicate carving in the spandrils.

To the right of the chancel of the church is a fine sedilia, of which a considerable amount of the original colouring has remained. The exterior is notable chiefly on account of the well-proportioned tower and spire, and, turning to details, for the pretty finish of the chancel buttresses; these have two set-offs, the first of 16 in., and the second, upper one, of 26 in., weathered off in the usual way, save that on the face the buttress was taken up to form a little gablet with a roll at the apex, all running back and dying into the splayed set-off. Now, the first lower set-off is treated in a similar manner, but the drip mould, which in both cases returns round the gablet, is taken along the side of the buttress at the edge of the weathered set-off running through the 26 in. of the buttress (which is carried up to the second set-off) and stops against the wall of the chancel.

The time allowed being at an end, the party again settled themselves in the conveyances and drove back to Swaffham, where the rector was waiting for them at the church. A few minutes were devoted to the examination of moulded base and carved plinth of the tower, which has the emblems of St. Peter and St. Paul in alternate panels owing to the joint dedication of the church to the two saints. The rector then took the members inside, giving on the way many interesting details. The chief beauty of the church is the fine double hammer-beam oak roof which was no doubt decorated with colour and gilding, as the unusual number of windows in the clearstory would seem to show in quite unmistakable fashion, there being two windows to each bay of the nave. This necessitates, however, a very low clearstory on account of the diminished points of support. The reverend gentleman, in the course of his remarks, referred to the beauties of the roof, which is said to contain no fewer than 141 angels, including those on each side of the king-posts at the apex. Continuing, he told the members the legend of the travelling Pedlar, too lengthy to insert here. He is supposed to have built the large, well-lighted north aisle, which one time contained chapels of the fifteen guilds established in the town; traces of these remain in the patched walls and variety of treatment in the windows, and no doubt the small and shallow transepts were also used for this purpose. Two benches having carved representations of the pedlar with his pack and a muzzled bear or dog and his wife doing business over the counter, respectively, in place of the usual poppy heads, are now used as reading-desks, and placed on each side of the chancel. There is a passage about 3 ft. wide leading obliquely from the north aisle to the chancel, which is very curious. It may either be a very unusually large hagioscope, or simply a passage arranged in this position for convenience merely. The door to the vestry is at its eastern end, and here the members were presently conducted, and after they had seen the ancient registers, dating from the early years of the XVIth century, all mounted a small winding stair to the little priests' chamber above, where is stored a curious and valuable church library. The most noteworthy of the several books seen were a beautiful book of hours, in the original beech boards, and with an illumination to each page. Another curious and valuable work was one of the first editions of the "Atalanta Nova," a geographical work with printed plates all coloured by hand; it contained a map of Africa, showing clearly the junction of the Blue and White arms of the Nile, and the lake system with the latter running through it; this map bears the date 1570. Also some deeds and conveyances of ancient date, one bearing the seal of Edward VI., and lastly the famous "Black Book of Swaffham," a survey similar to the Domesday Book.

Turning again to the exterior of the church, the tower, as usual, is the principal feature, and, contrary to the local custom, is constructed of dressed stone, the belfry having a large window on each face; the summit of the tower is crowned by a short lead flèche and surrounded by an embattled and panelled parapet with angle pinnacles, and a life-size (or thereabouts) figure on the parapet in the centre of each side. The main walls are of flint rubble, with the usual stone dressings, the exception being the clearstory, which is of brick and flint in alternate courses, with the uppermost part entirely of brick for the sake of lightness.

The party now adjourned to the vicarage, where they were entertained to tea by the vicar and his wife and daughters. After obligations had been suitably expressed by the President, the members walked through town to the station, and proceeded to Norwich by train.

Thursday, August 15.

An early start not having been decreed by the Hon. Secretaries this morning, members seized the welcome opportunity to have a little tour of investigation on their own account. All having been safely put in the train, they left at 9.30 for Fakenham, where they arrived late, and, consequently, only had a little over a quarter of an hour to see the church, a decorated building with a Perpendicular tower, a nave, north and south aisles, but no transepts. There is a remarkably fine sedilia in good preservation, and also at the west end of the church, opposite the south porch, a good decorated font stands with the Royal Arms quartering the *fleur de lys* on one side. The inside mould to the window arch was curious, with an intersecting bowtell at the start of the segmental arch.

The party were able to observe no more in the short time at their disposal, and they resumed their journey in the brakes to Walsingham, passing Great Snoring on the way. At Walsingham they dismounted at the large and partly ruined gateway to the Augustinian Priory. The portions of the "foundation" still standing are two, the east end of the great church and a small part of the refectory. The main walls of the former are still standing, together with the great arch of the east window, and a small circular window in the gable over, flanked on each side by lofty octagonal tower buttresses with rich flint and stone panelling. The ordinary buttresses are remarkably fine, with delicate carving on the angles, and beautiful canopies over the niches.

Close by stands a very uninviting house, owned, together with the Abbey and a considerable estate, by Mr. Lee Warner.

Passing on to the church, with its curiously warped and twisted lead-covered spire, they were at once struck, on entering, with the font, and, secondly, by the number of piscinæ and aumbrys scattered all over the church. The whole building is one of the most interesting and curious visited, and is well worth a visit. The plan consists of nave and aisles of six bays, with a western tower and porch; to the east a line of three steps and the chancel arch above terminates the nave, and the two aisles are treated in a similar manner. The wide transepts are placed one on either side of the choir or chancel, and divided from it by two unequal arches each side, one arch being more than double the span of the other; all this portion is raised above the nave and aisles as before mentioned. East of these curious transepts, which are devoted respectively to various tombs and the organ, runs the chancel proper, with the usual square ending. The most beautiful of the monuments in the north aisle is one to Sir Henry Sidney and his wife, dated 1612, having a beautiful alabaster figure of the knight in full armour with his lady behind. The nave piers are uncommon; for about one-third of their height they are square in section set anglewise, and above the square they die into a group of four filleted bowtells, these giving the favourite XVth century double ogee mould on each face. Above, the clearstory is much higher than usual, and the windows smaller and more widely spaced.

Turning to the richly-carved font, we observe another curious feature in the arrangement of the steps at the base. The font itself is octagonal on plan, as are the surrounding steps, but the alternate sides are sunk about 10 in. below the level of the upper step; thus the top step assumes the cruciform shape with radiating arms, the second step being the remaining sides of the octagon, whilst the whole is raised on a third step 10 in. wide running right round. All this is ornamented with beautiful foliated panels. A Jacobean cover of uncommon design surmounts the font, which

cover, from the inscription, would seem to have been the gift of the Sidney who lies buried in the north transept.

During the visit the rain descended with great violence, and continued more or less persistently for the remainder of the day. After lunch and a hasty glance at the few old houses in Walsingham the party drove on to East Barsham Manor, reputed to be the finest example of brickwork in the county.

Friday, August 16.

The party left Norwich at 9 a.m. by train for North Walsham, where they had an hour to inspect the church and such portions of the town as they had time for—which was nil. The church of St. Nicholas was seen, a large and spacious building, the date of which is unknown, but must have been in the second half of the XIVth century. The impression received on entering the church was of one large hall, and more careful examination tended to strengthen this first impression rather than to dispel it. The plan of the church is very simple, and is composed of a wide and lofty nave and two equal aisles running the whole length of the church; the tower, a portion of which still remains, is placed at the west end of the nave, and a short length of solid wall on each side of its eastern extremity forms the chancel and a chapel to the south aisle, the same space in the north aisle being used as a vestry. The great rood-screen was placed some distance—two bays—into the nave, but the lower panels, finely painted with various saints and their emblems, are all that is left of this once magnificent structure; the parclose on each side seems to have vanished altogether.

The construction of the roof is very ingenious, and was evidently adopted in order to distribute the weight as much as possible, for, as there was no clearstory, the aisles were necessarily of great height in order to get sufficient window space for the adequate lighting of the nave; the tie-beams, therefore, of the aisle roof have in all cases been carried through the nave arcade wall, and project sufficiently on the nave side to form a corbel on which the principals of the great central roof rest, and are also so spaced that they come in the spandrils, directly over the piers of the nave arcade. There is a fine Jacobean monument on the north wall of the chancel to Sir William Paston, executed two years before his death at a cost of 200*l.* by a certain "John Key, a Freemason of London," having, in addition to the central shield, eighteen surrounding it, impaling various other coats. Opposite is a good sedilia and aumbry. The great east window is modern, but of good design, the original one having been blown out in a gale which occurred in 1809. A curious feature of the aisle windows is the variety of character they display, most of the original ones having been destroyed during the peasant rising in 1381, when the church was occupied under the leadership of "John the Dyer."

The south porch is a beautiful piece of flint panel work with stone dressings and tracery. In the spandrils of the entrance archway are, on the left, the arms of John of Gaunt, and on the right the ancient Royal arms with the *fleur de lys* quartering. The tower fell in two sections, the first in May, 1724, and the second in February, 1836. The font and cover must have been good works, but have been much defaced. There is also an interesting board with the Commonwealth arms on one side and those of Charles II. on the other. The party now drove on to Aylsham, and there saw another church of about the same period but much smaller, and with a much more conventional type of plan, both the aisles being later additions or rebuildings in the Perpendicular manner. The fittings were, however, what engaged attention in particular, including the remains of the fine rood-screen painted with saints and martyrs, the lower panels of which are still most sumptuously decorated with gold and colours, the date, 1507, still being legible. A beautifully preserved Jacobean pulpit had quite a little army of sketchers gathered round it, and the charming south porch with parvis, and the most delicate canopied niche and flint and stone panelling claimed not a little attention. However, the members were not allowed to linger, but immediately after lunch at the old Black Boy's Inn, settled themselves in the brakes and drove off to Wolterton Hall, the seat of the Earl of Orford, who had kindly arranged for a visit at short notice when it was found impossible to visit Bickling as at first intended.

The members approached the house by a long avenue, and were set down at the front door, but had not much time to take in the elevation, as they were immediately ushered into a very spacious, lofty room on the first floor called the saloon. The general plan of the house is oblong in shape, the two fronts being about half as long again as each of the two sides; the building is divided into three by two walls parallel to the fronts; of these three divisions the two outer ones are 23 ft., and the central portion containing the stairs about half that width. Three rooms are arranged on each front, the corner ones having windows—now blocked in some cases—on the two sides, there being a small room on the return in between them in each case, equal to the width of the central portion referred to above. His Lordship took the party round the State apartments. Leaving the saloon, where some fine tapestries decorate the walls, and numerous charming pieces of furniture assail the eye on every side, the party crossed the landing to the central apartment of the opposite front, formerly the great entrance-hall, with a large flight of steps leading up from the forecourt to the central door. This room is now called the marble hall, and on the walls are family portraits of some of the early Walpoles; on the left is the dining-room, with a good portrait of one of the Georges, "presented by His Majesty." The date of the house is about 1720, and the present owner has done a great deal to the interior, which seems to have been in a very bad way at first. The party went through three more rooms, including the saloon, as far as the boudoir, where his Lordship pointed out a portrait of Amy Robsart, who was related to the Walpoles by marriage.

Round the corner was a bedroom used by Queen Anne.

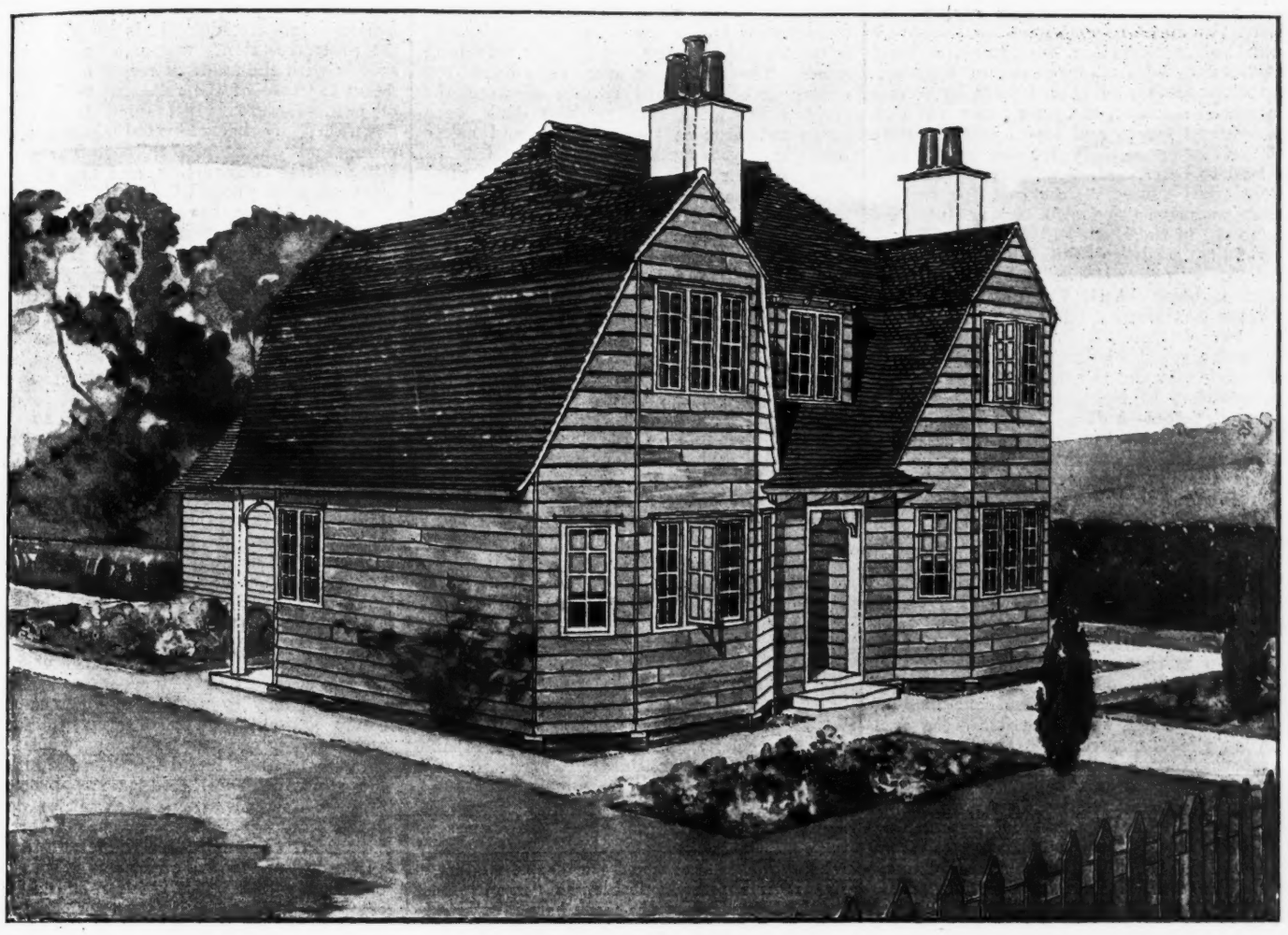
Downstairs the members went through the everyday apartments—library, billiard-room, dining-room, etc.—then proceeded along the terrace and to the kitchen gardens, enclosed with high walls, and forming nearly a square about 4 acres in extent, with greenhouses, vineries, and fruit trees of all kinds. After a walk round the members had a short space to themselves, which was spent in studying and sketching the exterior, which has a great deal of breadth and dignity. The central room on each front projects slightly, this forming a break forward of main front, with the two smaller rooms at the corners forming, as it were, two wings. The main front has three windows on each floor, of which there are but two; the windows of the second floor, being almost square, form a pleasing contrast with the long ones of the principal floor. Above is a pediment and a bold stone cornice running all round the house, finished off on top with a blocking course and balustrade, which stops against the low gable of the pediment. The roof is covered with old green slates, the central portion being a lead flat with a large skylight over the stairs. The chimneys are carried up square with a plain ashlar face, finished with a capping at the top. On the return elevation the central window is what is known as the Venetian type—a semicircular headed window flanked by two square-headed ones—on each floor.

The windows all have stone dressings, the general walling being of red brick. After tea in the dining-room, seated at the long table, the Vice-President expressed the deep obligation of the party to his Lordship for his kindness and hospitality, and the members returned to Aylsham, with a two-minutes' halt at Ingworth to see the quaint little church on the way. After dinner, sketch-books circulated, and, according to custom, the evening finished with the singing of "Auld Lang Syne."

Saturday, August 17.

To-day was the only day the members had left for Norwich. Of course, it was not possible to arrange anything else, but the idea of seeing Norwich in a morning is sufficiently ludicrous, and we shall therefore not mention those two glorious buildings one always associates with Norwich—we mean, needless to say, the famous cathedral and the Church of St. Peter Mancroft. Under the guidance of Mr. Leonard Bolingbroke the members proceeded to the old house called "Curat House," from the name of the first owner and builder, John Curat, who began this house in 1501 on the site of the old Jewry. The party were received by the present owner, who was able to give much information about the building, and took the members to the large living-room on the first floor, panelled and ceiled in oak, with some quaint rebus panels and linenfold devices of a rather un-English character, which is probably accounted for by the fact that John Curat had Italian workmen in his employ at this period. In the room below, on the ground floor, was a very handsome XVIth century ceiling, only discovered by accident by the present owner, Mr. Back. The main beams are richly moulded, and the panels between contain carved shields with arms, monogram, and rebus, etc. All the south side of this room is occupied by two seven-light windows about 9 ft. high, with a central transom running right through. The members next paid a visit to the Guildhall, saw the fine council chamber, and noticed a Queen Anne screen with coupled columns and a bronze gate to the stairs; then, continuing on their way, they passed the old Bridewell, once the house of a certain Appleyard, first Mayor of Norwich, who built it in 1380. The front wall is one of the finest bits of squared flint-work in the county. The party now turned northward again, and, led by Mr. Bolingbroke, visited one of the most curious remains of ancient Norwich in the "Stranger's Hall," a wonderfully preserved house, dating from the XIVth century, the present building consisting of a large hall and adjacent rooms dating from the XVth century. It was purchased in 1899 by Mr. Bolingbroke in order to save it from demolition, and he has now collected here a grand series of mediæval relics of all sorts in a way quite beyond praise. Several accounts of the building have been published in various forms, and space will not permit us to further enlarge on its beauties. They next had a look at some of the more important of the forty-two Norwich churches—St. Gregory, with the chancel raised nine steps above the nave, and with a nice font; St. George Colegate and St. Miles, which were viewed *en passant;* and the "Octagon" chapel, built 1756, and a good example of the work of the period, with oak pews and gallery front. The vaulting over the gallery is curious, the soffit of the arches round the centre octagon running back to the crown of the vault. They next looked into a house opposite with two good ceilings and elaborate door and setting in pitch-pine, the date on the rain-water heads being 1743. Next they had their attention drawn to a curious old door from the city house of the Prior of Walsingham, John Aldrich, 1507. Then, to finish up, they went over Sir Peter Eade's house, dating from the early XVIIIth century, where the excursionists saw a room of the period with plaster decoration, painted panels, etc., quite intact, and were most kindly entertained by Sir Peter. This ended the proceedings, and the members dispersed to the various quarters of town and country, with the pleasant memory of a profitable week.

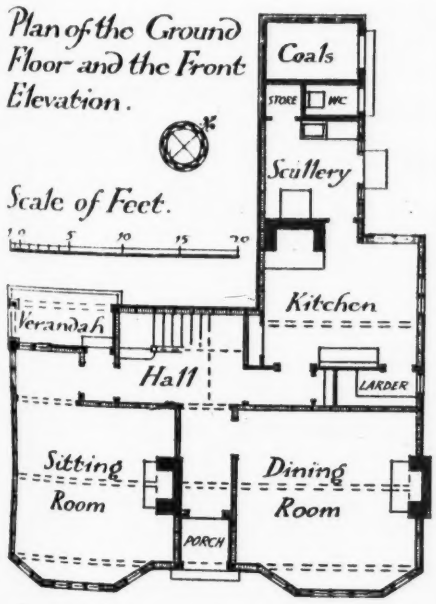
STREET IMPROVEMENTS, &C., AT LINCOLN.—The Lincoln City Surveyor (Mr. R. A. MacBrair) has presented to the Council his report of the year's work for the twelve months ended March 31 last. By the direction of the Highways Committee the mileage of streets and roads in the city has been increased in the last seven years by 6 miles 1,459 yds., the total mileage of public streets at the present time being 45 miles 1,264 yds., and of private streets 4 miles 1,167 yds. In addition to this, various public roadways and footpaths, of a total extent of 1,118 yds., are maintained by the public authority. The Committee have directed the laying down of 3,838 sq. yds. of new asphalting, in addition to ordinary asphalt repairs and sanding and tarring, and the extension of the system of tar macadamisation has been carried on in St. Mary-street. There are now 1,648 street lamps, an increase of 29 on the year. Of the total, 75 are electric lamps, 39 are arcs, and 36 are incandescents. The Health Committee's section of the report contains mention of the mileage of main sewers (exclusive of surface water drains) as 43 miles 1,119½ yds. The Building and Improvement Committee's report states that plans for 402 new buildings, including 241 houses, were passed during the past year.



House at Maplefield, Chalfont-road.

A SMALL HOUSE AT MAPLEFIELD, CHALFONT-ROAD, BUCKINGHAMSHIRE.

THIS house, although timber built in a district which has no prohibitive by-laws, is in no sense intended to be a temporary structure. The timber used for the external framing and covering is Australian jarrah,



Small House at Maplefield, Chalfont-road.

the chief advantages of which are that it is practically fireproof and exceedingly strong and weather-resisting. In order further to increase the last-mentioned quality in the building a lining of inodorous felt was laid in the external framing before the boarding was fixed, and the boarding itself treated with a light coat of Solignum to close the pores of the wood. Boiled linseed oil is usually recommended for this purpose, but the glossiness thereby imparted is not pleasing.

The framing rests on a brick plinth with concrete base, and, except for the external jarrah framing, the building is constructed in the usual manner.

It has proved itself during the heavy rains of the past spring absolutely weather-proof, and there seems no reason why buildings constructed in this manner should not be erected in rural and suburban districts without any of the restrictions which apply to wooden structures in general. The roof is covered with local bright red hand-made tiles.

The general contractor for the work was Mr. William Tout, of Hendon, and the jarrah was supplied by Millar's Karri and Jarrah Company, Ltd. F. J. POTTER.

SOME NEW USES FOR REINFORCED CONCRETE.*

BY W. NOBLE TWELVETREES, M.I.MECH.E.

SO MANY papers have been read of late, discussing the general principles governing the design of reinforced concrete structures, and describing works of familiar character in which reinforced concrete has been adopted as the material of construction, that the author thinks it well on the present occasion to follow a somewhat less-frequented path.

Under the title selected for this paper, he considers briefly some types of construction that have not yet been applied in this country, others that have been adopted only quite recently, and others again that are not new in themselves, but are suitable for employment in novel directions.

In the first category may be placed such constructions as railway sleepers, standards for overhead electric cables in power transmission and electricity distribution systems, and poles for telegraph and telephone wires.

Reinforced concrete railway sleepers are to be found on several lines in the United States. Fig. 1 contains details of the Campbell sleeper, some 150 of which were laid down on the Elgin, Joliet, and Eastern Railway in 1905, and 1,000 on the Chicago, Lake Shore, and Eastern Railway during last year. This sleeper is of concrete, reinforced by two old boiler tubes and a surrounding ring of wire netting. According to the published results of tests, the Campbell sleeper is capable of withstanding loads up to 80,000 lb. applied at the rail seat before showing signs of failure by crushing, and of supporting transverse loads up to 10,000 lb. applied at the middle, the rail seats being supported on blocks at the distance of 5 ft. apart.

Fig. 2 illustrates the type of sleeper adopted on the Chicago and Alton Railroad by Mr. G. H. Kimball. Sleepers of this type have been in service on that line since 1901, and have proved capable of withstanding the effects of traffic in a perfectly satisfactory manner.

The sleeper consists of two blocks of concrete, each 3 ft. long by 7 in. thick by 9 in. wide, connected by two 3-in. steel channel-bars embedded in the concrete blocks. The rails are secured by spikes upon hardwood blocks intended to absorb shocks and distribute pressure. The small drawing at the right-hand bottom corner of Fig. 2 shows three of the sleepers as laid on the permanent way.

Other types of reinforced concrete sleepers are in use on several American railways, and the fact that the employment of the material for the purpose has been taken up seriously in a great timber-growing country should serve as a hint to railway engineers in this country, where the cost of timber tends to increase year by year.

The Caio sleeper, adopted experimentally on the Italian railways in the year 1900, has shown satisfactory results, and it is stated that the authorities have decided to lay 300,000 sleepers of the same type. As shown in Fig. 3, the sleeper is reinforced in a somewhat complicated manner by longitudinal steel rods interlaced with wire, while vertical rods and netting are placed beneath the chair seats and some netting in the middle portion of the sleeper.

Reinforced concrete poles have been used for some time past for carrying the cables

* A paper read at the recent meeting of the British Association. We reproduce three only of the illustrations which accompanied the paper.

employed in power-transmission systems in various Continental countries. An improved method of construction has recently been introduced by Messrs. Siegwart, of Lucerne, for the production of hollow poles by means of a special machine, the poles being made to any required length and taper, and the concrete reinforced suitably for the length and the load to be carried.

Reinforced concrete standards for power-transmission lines are also coming into extensive use in the United States. Fig. 4 contains full details of the standards for a three-phase power-transmission line, the standards being 49 ft. 7½ in. high, with a minimum clearance of 30 ft., and reinforced with twelve ⅜-in. and ⅞-in. longitudinal bars, and a spiral winding of ¼-in. steel wire. Commencing at the top of Fig. 4, and reading from left to right, we have—after the general elevation—a detail of the top pin and socket, a part elevation of one of the lower cable pins, and below these two drawings a plan of the pin bracket. The next details illustrate the double-pin bracket employed for standards intended to be guyed, and the top fitting for guyed standards is shown below. The system of guying is shown by the two drawings at the bottom right-hand corner, the remaining detail being a horizontal section of the standard near the base.

The utility of reinforced concrete for purposes such as those now under consideration should appeal to the Post Office and railway companies, as well as to those concerned in electricity undertakings, since reinforced concrete is an ideal material for the construction of telegraph and telephone poles. An instance of enterprise in this direction has been afforded by the Pennsylvania Railroad, by whom a mile of telegraph poles was erected in the autumn of last year. The poles, from 25 ft. to 34 ft. long, were made of concrete, reinforced with twenty-four ¼-in. rods, and their transverse dimensions were 8 in. square at the bottom tapering to 6 in. square at the top, the corners being chamfered so as to give an octagonal cross-section above the ground. The work was hurried so as to have the line ready for inspection at a given date, and, in consequence, some of the poles were erected within five days after they had been made. Notwithstanding this hasty construction, and the severe windstorms of last winter, it is stated that the poles were in almost perfect condition in May this year. This experience is sufficient to indicate the exceptional suitability of reinforced concrete for the purpose named.

Foremost among examples in the second category should be mentioned the Scotstoun dock, recently completed on the Clyde for the Coventry Ordnance Company. As an entirely new departure in marine engineering this work deserves consideration.

This dock (Fig. 5) is small, as such works go, having the length of 176 ft., the width of 48 ft., and the depth of 50 ft. from quay level to the bottom. The walls are reinforced by a network of "Indented" steel bars, and are strengthened by fourteen counterforts which also serve the purpose of supporting the gantry for a heavy travelling crane. The detail at the right-hand top corner is an enlarged section showing the construction more clearly. The dock walls curve outwards at the entrance, and merge into quay walls measuring 188 ft. and 47 ft. long on either side, as shown in the plan. The design as a whole represents sound and substantial construction, the concrete being monolithic throughout, and reinforced in such manner as to afford ample resistance to tension, and to guard against the development of temperature cracks.

Another novel and useful application of reinforced concrete to marine engineering is to be found in the breakwater built as a protection to the fishing harbour at Passage East, in the estuary of the River Suir, near Waterford (see Fig. 6). This work, built by the Irish Board of Public Works in accordance with the Hennebique system, is 120 ft. long by about 20 ft. wide. The foundation consists of a cofferdam made by driving reinforced concrete grooved sheet piles, from 15 ft. to 30 ft. long, according to the depth of the river bed, formed into a water-tight wall by dowels of cement grout filled into the adjacent grooves in the sides of the piles. The cofferdam was filled up with rubble, and from its upper edge was built up a superstructure consisting of reinforced concrete columns, walings, diagonal bracing, longitudinal and transverse deck beams, with lateral curtain walls, and a continuous decking. All these portions of the structure are monolithically connected and reinforced by a complete network of steel bars. A breakwater of this kind would manifestly be inadequate for the open sea, but for comparatively sheltered positions, where trouble is caused by waves of moderate size it is entirely suitable, as demonstrated by the behaviour of the work here illustrated.

Figs. 7 to 10 illustrate the sea-wall and protective slope, designed by Mr. Nelson F. Dennis, the Borough Engineer of West Hartlepool, and built under his direction between that town and Seaton Carew. The total length of the work is about two miles. It commences at Seaton Carew as a retaining wall, the batter of which is gradually increased until the wall merges into the protective slope. The retaining wall consists of a foundation slab, counterforts, and a face wall, and the structure is prevented from sliding seawards by timber piles and walings, as shown in Fig. 7. All the different parts of the construction are reinforced by expanded metal, so that the quantity of concrete necessary was reduced to an absolute minimum. This will be realised when it is stated that the foundation slab is only 6 in. thick, the counterforts 6 in. thick, and the face wall 9 in. thick at the bottom and 5 in. thick at the top. Stability against overturning is assured by the weight of the earth filled in behind the face wall and resting upon the counterforts. Fig. 7 is a section of the construction beyond the border of Seaton Carew. Fig. 8 is a section of the protective slope, whose inclination corresponds with the angle of repose of the earth. As in the case of the retaining wall, the toe of the structure is prevented from sliding downward by being butted against timber piling and waling pieces. Fig. 9 is a view taken during construction, and Fig. 10 shows a portion of the completed work.

In Fig. 11 we have a perspective sketch illustrating the ingenious application of reinforced concrete to the construction of groynes for foreshore protection. These groynes, devised by Dr. J. S. Owens, A.M.Inst.C.E., consist of standards driven as piles, or otherwise secured in the shore at suitable intervals apart. They are made with grooved sides, so that reinforced concrete slabs can be slipped in place quite readily and fresh slabs be added as those first applied are covered by the accretion of beach material. The standards and slabs are made in accordance with the Hennebique system, and, in addition to the superior durability of the material as compared with timber, its weight is an important factor, causing the slabs to sink down to any altered contour of the beach in consequence of under-runs. Groynes of this kind have recently been applied by the Sussex County Council and other authorities in the vicinity of Brighton. Figs. 12 and 13 are views of the groynes erected at Roedean.

Turning now to work of a different class, it may be pointed out that several reinforced concrete bridges for railway traffic are already to be found in Great Britain. These may be considered as stepping-stones towards the application of the same material to the building of important railway bridges and viaducts for main-line traffic.

In addition to its superior durability as compared with that of steel, reinforced concrete permits the realisation of light and graceful designs that are out of the question in brick, stone, and plain concrete. This point is illustrated by Fig. 14, where the upper sketch is the elevation of a plain concrete railway viaduct, built a few years ago in the South of England. The viaduct is 600 ft. long, and includes ten arches of 50-ft. span. Owing to the unstable character of the ground, and the weight of the structure, considerable trouble was caused by settlement, and especially by a land-slip at the western abutment and the adjacent pier, the effect of the subsidence being to crack the first arch at the crown. The lower sketch shows the viaduct as it might have been built in reinforced concrete without materially exceeding arch spans already realised in actual practice. In a design of this character, the outward thrust of the arches would naturally oppose any tendency of the embankment to slide downwards, and perfect stability of the foundations could easily be secured by building them upon reinforced concrete piles driven down to a sufficient depth.

An example of far bolder design than that

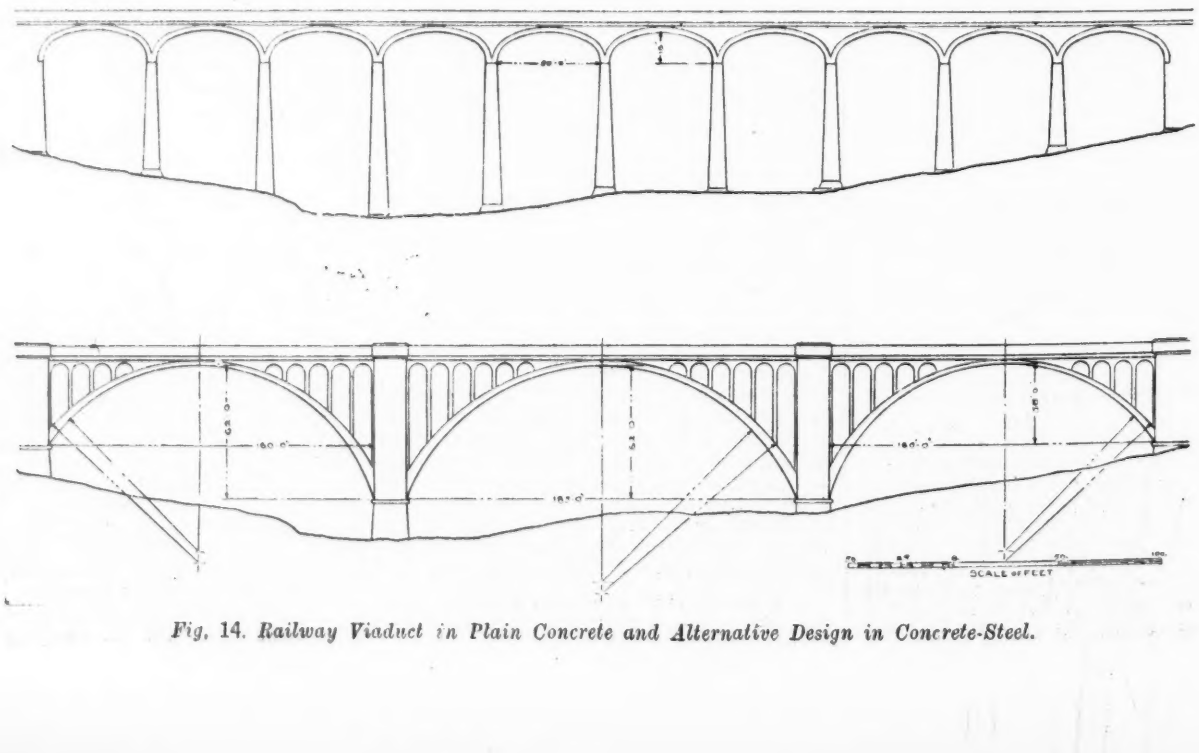


Fig. 14. Railway Viaduct in Plain Concrete and Alternative Design in Concrete-Steel.

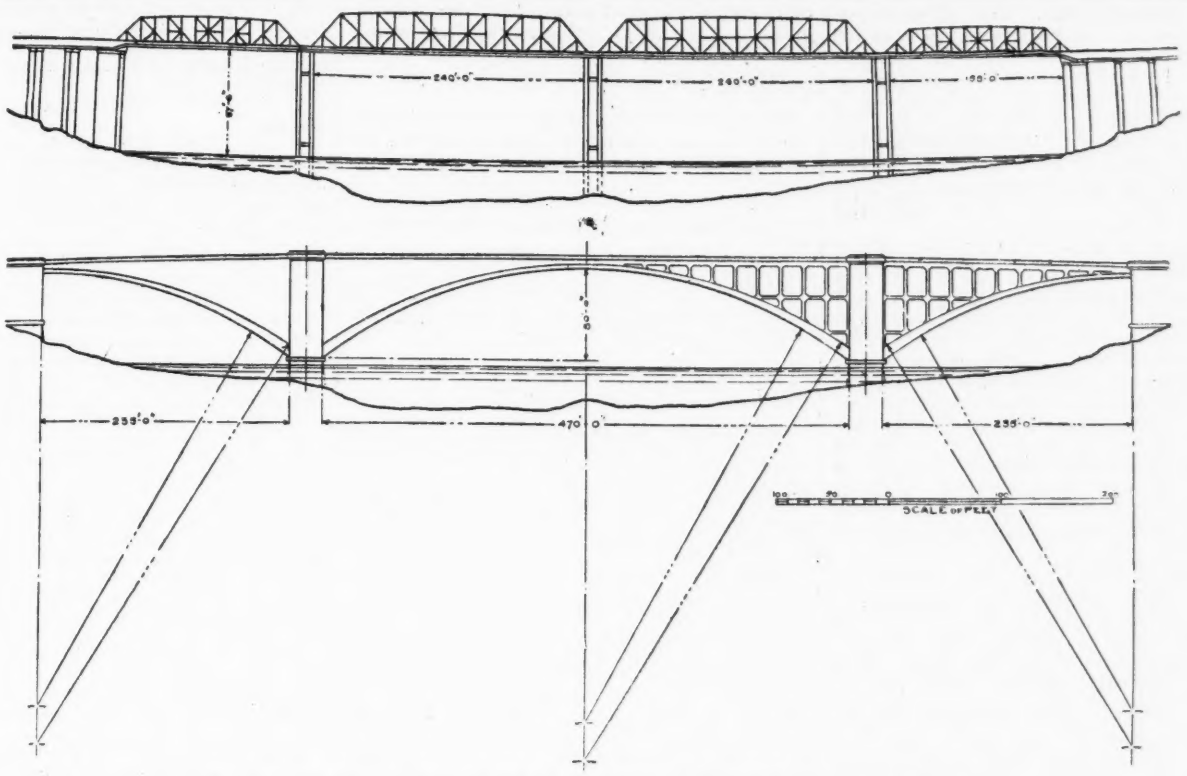


Fig. 19. Highway Bridge in Steel and Alternative Design in Concrete-Steel.

suggested in Fig. 15 is afforded by the Plougastel bridge, authorised for construction by the French Government, and designed in accordance with the Considère system of hooped concrete. This bridge includes two cantilever and bowstring girder spans of 317 ft. 9 in., two latticed girder spans of 106 ft. 7 in., and one similar span of 52 ft. 3 in., apart from the swing span at the right-hand end, which is to be built in steel. The bridge will carry road traffic and an electric tramway.

Another striking example of reinforced concrete railway viaduct construction is to be found in the extension of the Florida East Coast Railway from the mainland to the Island of Key West. The new line is being carried across the series of islands known as the Florida Keys, and for some seventy-five miles of its length will cross the sea on embankments and viaducts. In places where the depth is considerable, and the channels are exposed to storms, reinforced concrete viaducts will be built, ranging in length from nearly a mile to more than two miles each.

Fig. 16 is part of the longest viaduct now in course of completion. The structure comprises 217 arches of 50 ft. span, supported on piers rising from the sea bed 10 ft. to 30 ft. below the surface, and carrying the railway at a height of 31 ft. above water level. It will probably be conceded that the construction of these viaducts shows that American railway engineers are quite prepared to accept reinforced concrete as a trustworthy and durable material for use under exceptionally trying conditions.

As final illustrations of reinforced concrete railway bridges and viaducts, two views are given of other typical structures in the United States.

Fig. 17 is a photograph of the Danville double-track bridge, with two spans of 80 ft. and one span of 100 ft. on the Cleveland, Cincinnati, Chicago, and St. Louis Railroad, this work having been designed on the "Indented Bar" system.

Fig. 18 is a view during construction of the double-track railway viaduct, designed on the Kahn system of trussed concrete, for the Richmond and Chesapeake Bay Railroad across the City of Richmond. This viaduct is about two-thirds of a mile long, in some places it is 80 ft. high, and it is said to be the largest reinforced concrete construction in existence.

Several graceful highway bridges of moderate span have been erected in Great Britain on the Hennebique and other systems, but the claims of reinforced concrete as a material for spanning important rivers still remains to be recognised in a practical manner.

In France we have the Decize bridge on the Loire with two arches of nearly 184 ft. span; in Belgium the River Ourthe bridge at Liége with a central cantilever span of 180 ft.; in Bavaria the Isar river bridge at Grünwald with two arches of 230 ft. span, and girder approaches bringing the total length up to 700 ft.; in Spain the Bormida bridge with an arch span of 167 ft.; in Portugal the Pena river bridge with five arches of about 115 ft. span; and in the United States the National Memorial bridge across the Potomac, having the total length of 3,400 ft. and including six reinforced concrete arches of 192 ft. span.

All the foregoing are fine bridges, and some of them are truly monumental. There is nothing approaching them, so far as concerns reinforced concrete, in our own country, where steel girders or arches are usually employed for long-span bridges.

Fig. 19 serves to suggest that the necessity for this practice no longer exists. The first drawing represents a steel-girder bridge, built about five years ago, with two spans of 240 ft. and two of 155 ft., carrying a roadway 90 ft. above the river.

The second drawing gives an idea of what could have been done on the same site in reinforced concrete without involving greater expenditure, embodying a far more graceful type of design, and obviating the necessity for painting and maintenance charges.

In London, when old Vauxhall Bridge was found to be unsafe, the decision was made to replace it by a plain concrete structure. Unfortunately this involved comparatively short spans and so much weight that it was found necessary in the end to build the arches of steel in order to reduce the load upon the foundations. If reinforced concrete instead of plain concrete had been decided upon at the outset, all essential conditions could have been satisfactorily met, and the bridge might have been made a really fine example of progress in constructive work as well as an ornament to the metropolis.

As Southwark Bridge will be rebuilt at no distant date, the opportunity again offers for the erection of a structure worthy of being ranked with the great reinforced concrete bridges of the world. There would be no difficulty in spanning the river by three arches of the same length as those in the existing bridge. Fig. 20 contains outline elevations of the existing bridge and the general character of the design suggested by the author.

The three spans of 210 ft., 240 ft., and 210 ft. respectively would be much lighter than either the present cast-iron arches or solid masonry, consequently avoiding the risk of any trouble such as that experienced in connexion with the rebuilding of Vauxhall Bridge.

The æsthetic treatment of a bridge such as this is a matter scarcely coming within the scope of the present paper and the author contents himself with an expression of the opinion that with architectural co-operation engineers should have no difficulty in dealing with reinforced concrete so as to make any structure of the kind pleasing to the eye as well as appropriately expressive of the constructive design and of the material employed. Unfortunately there is a tendency amongst engineers to hide the true features of reinforced concrete construction by attempting to reproduce mere imitations of masonry structures, instead of developing the exterior in harmony with the mechanical principles actually involved.

Passing on to the third category, attention will now be drawn to structures illustrating the suitability of reinforced concrete as a material for the construction of railway-station roofs, locomotive depôts, and bridges over railways, wherein steel-work is particularly liable to corrosion by reason of its exposure to steam and destructive gases from locomotive engines and boilers.

Fig. 21 is a part elevation of the principal façade of the Renommée Hall at Liége, a building constructed entirely in reinforced concrete and suggesting the adaptability of that material for the design of rust-proof and fire-proof coverings for railway-stations. In this particular structure the roof comprises a terrace and three domes, each of 55 ft. diameter, but it is quite clear that a series of arched roof spans could very easily be designed on the lines indicated by the drawing.

The fashion for gigantic roof spans, such as those of St. Pancras and Cannon-street, is now on the wane, and the type of construction favoured in the present day is well illustrated by the new roof of Charing Cross Station, where latticed girders extend from side to side of the station, with two lines of intermediate supports, and carry several small roof spans arranged on the ridge and furrow system. A similar method of construction would be quite feasible in reinforced concrete by building a series of small roof spans upon transverse girders or upon arched supports of the graceful type suggested by the elevation of the Renommée Hall, Liége.

Another direction in which the use of reinforced concrete should be specially valuable to railway engineers is in the construction of locomotive depôts. The life of steel-work in such buildings cannot be put at more than about fifteen years, and although timber is more durable, the risk of fire is

inseparable from its use. Fig. 22 contains part longitudinal and transverse sections of the locomotive depôt built from the designs of Professor Bosset on the Jura-Simplon Railway, near Lausanne, the building being about 165 ft. long by 215 ft. wide. Fig. 23 gives details of the roof-lanterns and smoke-hoods, these, as well as other parts of the building, having been constructed of reinforced concrete, in accordance with the Hennebique system.

It is difficult to understand why reinforced concrete has not yet been applied in this country to the construction of road and other bridges over railways, where the injury caused to steel-work is very serious. The importance of the problem has been fully recognised in the United States, where reinforced concrete bridges are rapidly taking the place of steel structures in country districts as well as in large cities. Fig. 24 contains views of two overhead crossings on the Cleveland, Cincinnati, Chicago, and St. Louis Railroad, these bridges being entirely of concrete reinforced on the indented bar system.

In a recent paper by Mr. George S. Webster, Chief Engineer of Surveys of Philadelphia, it is stated that the almost total destruction of several iron highway bridges over steam railways, at places where reinforced concrete arches could not be built owing to lack of headroom, has resulted in the design of steel bridges, all the members of which are encased in concrete, and which have concrete jack-arches instead of the usual trough flooring. Mr. Webster believes that this composite type of structure will be much more permanent and at the same time more economical than steel construction.

Apart from these considerations the employment of concrete in conjunction with steel is worthy of attention by local authorities who desire that their districts should not be needlessly disfigured by the girder construction favoured by most railway companies.

Fig. 25 is a view of the Wabash Railroad bridge in Forest Park, St. Louis. This is a plate girder bridge with concrete floor, hollow abutments, and ornamental balustrade, reinforced on the indented bar system. As all the steel is protected from corrosion, the cost of maintenance is avoided, and, as may be judged by the illustration, the structure cannot be regarded as an eyesore to those making use of the park in which it is situated.

In conclusion, it may be added that reinforced concrete has been largely applied on the Continent and in America to the construction of foot-bridges in railway-stations, but British railway engineers continue to use steel for the same purpose. If all bridges of the kind now in existence were cased in concrete they would be rendered proof against destructive influences, and the saving in maintenance charges would soon repay the capital expenditure necessary.

NEW PUBLIC ELEMENTARY SCHOOL BUILDINGS.

THE following regulations under which grants for the building of new public elementary schools in England and Wales will be made by the Board of Education after the passing of the Appropriation Act, 1907, during the year ending March 31, 1908, have been issued as a Parliamentary paper :—

After the passing of the Appropriation Act, 1907, the Board of Education will, during the financial year ending March 31, 1908, make grants, in circumstances which in the Board's view will render such grants expedient, in aid of the building of public elementary schools provided by local education authorities in accordance with the following regulations. Applications for these grants may be made to the Board by any local education authority; and the Board will also consider, and bring to the notice of the local education authority concerned, any cases brought before them by minor local authorities or by parents.

1. No grant will be made in respect of any building or enlargement for which the building contract was signed before August 1, 1907.

2. The grant may be paid in respect of the acquisition of sites or the erection of buildings or the enlargement of existing buildings.

3. The grant, which will be payable to local education authorities only, may be for a proportion, or where the Board think fit, for the whole of the expenditure incurred for the provision of the site and building. Any question as to the allocation of the grant arising in connexion with section 18 (1) (*c*) of the Education Act, 1902, shall be determined by the Board.

4. The building, in respect of which the grant is paid, must be clearly distinguishable from any neighbouring buildings.

5. Except in the case of temporary buildings a grant will not be payable in respect of a leasehold site where a freehold site can be obtained and no lease should be for a shorter time than seventy-five years.

6. The plans must be approved by the Board.

7. The Board will require an undertaking under the seal of the authority that the building in respect of which a grant is made under these regulations will not be used for purposes other than those of a public elementary school, at any such time or in any such manner as will interfere with the work of a public elementary school. The undertaking must bind the authority to refund, in the event of the Board so requiring, the whole or part of the grant if this condition ceases to be satisfied, or if the school ceases to be recognised as a public elementary school.

8. The provisions of sects. 8 and 9 of the Education Act, 1902, must have been fulfilled so far as they apply, before any grant is paid under these regulations; but, on the expiration of the three months' notice required by sect. 8 of that Act in the case of new schools, the Board will be prepared to pay a grant under these regulations in respect of any sums, whether paid by way of instalments or otherwise, which may have been actually disbursed from time to time by the local authority between August 1, 1907, and March 31, 1908, in respect of the provision of sites or buildings in accordance with these regulations, and which are approved by the Board for the purpose of calculating this grant; but no grant will be payable under these regulations after March 31, 1908, unless a similar grant is sanctioned by Parliament in respect of the financial year ending March 31, 1909.

9. The Board must be satisfied that the accommodation to be provided, whether by permanent or temporary premises, is necessary within the meaning of sect. 9 of the Education Act, 1902. In considering this point the Board must, *inter alia*, be satisfied by the submission of satisfactory evidence that the parents of not less than thirty children of school age desire accommodation in a public elementary school provided by the local authority, and that the only existing public school accommodation of a permanent character available for those children is in schools not so provided. In no case will a building grant under these regulations be payable in respect of school places which are needed to make good a numerical deficiency of public elementary school accommodation, and which the local education authority would therefore (in the absence of other proposals for supplying that deficiency) be obliged in any event to provide.

10. The decision of the Board as regards the interpretation of these regulations is final.

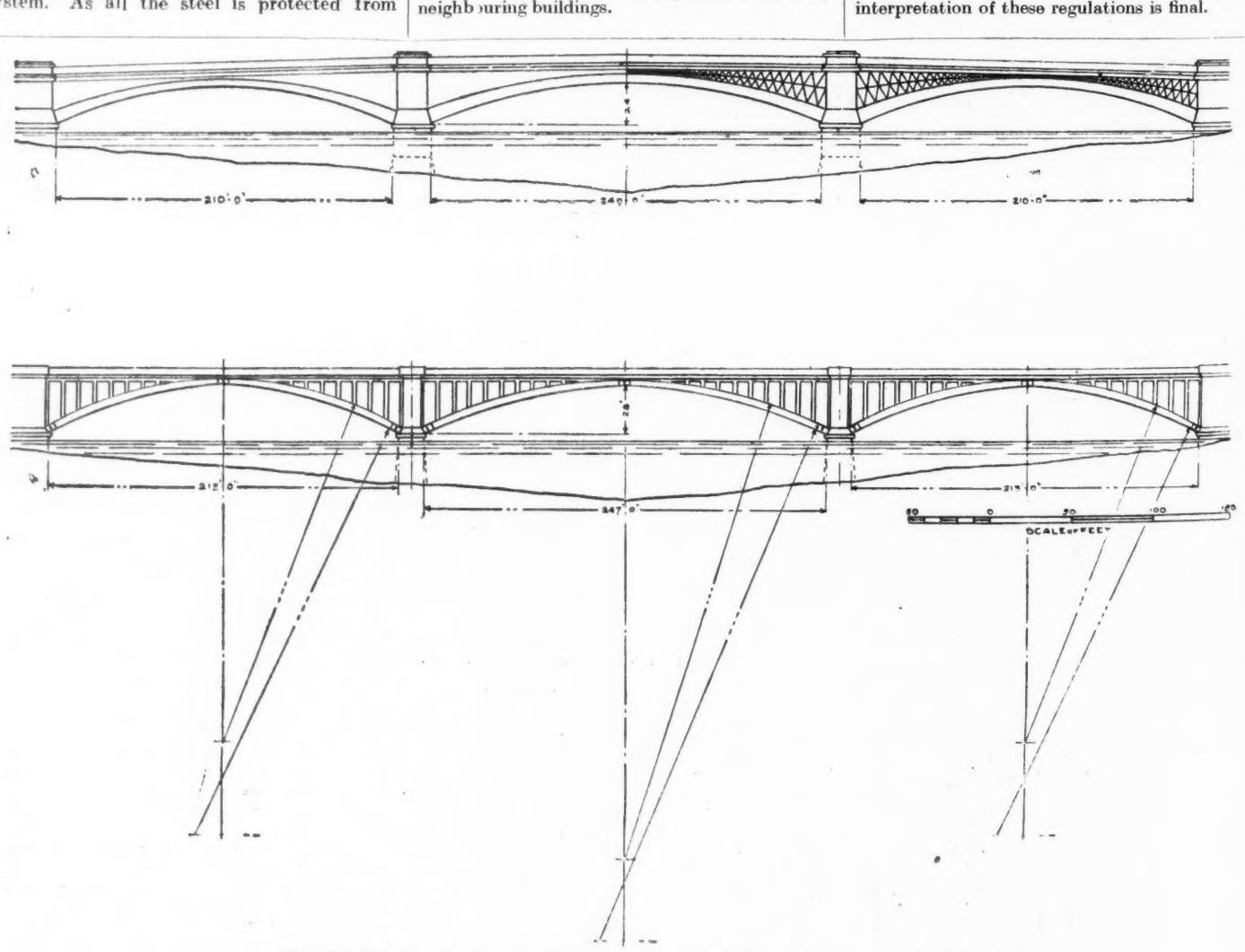


Fig. 20. Existing Southwark Bridge and Proposed Design in Concrete-Steel.

Fifty Years Ago.

FROM THE *Builder* OF AUGUST 22, 1857.

RUINOUS BUILDINGS, METROPOLIS.

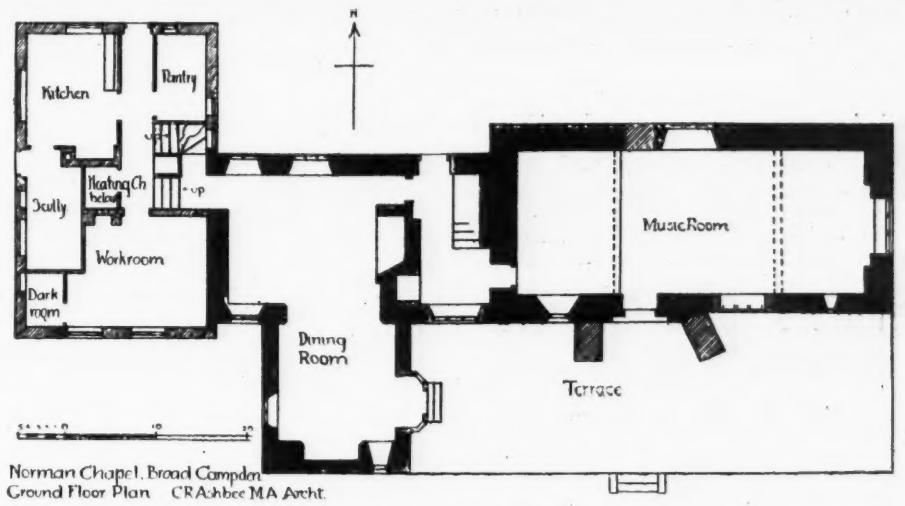
AT Marlborough-street, on the 15th, a great deal of time was devoted by Mr. Beadon to the hearing of summonses served on the owners or occupiers of dilapidated or highly ruinous buildings in the district of this court.

It was contended by a professional gentleman (understood to be surveyor to the Marquis of Salisbury) who appeared for the owner of the property, No. 5, Cranbourn-passage, that the authorities had exercised a very arbitrary power in coming on the premises and giving peremptory directions respecting them, which had put his client to considerable expense, and that unnecessarily. It was stated that the intention had been to take down the dangerous part, but they had now been called upon to shore up a portion, and thus increase the expense, and that there was no occasion for this. He was of opinion that the magistrate's time was very unnecessarily occupied by summonses for such cases as the one in question.

Mr. Beadon said he was quite of another opinion. A very salutary Act of Parliament had been properly put into operation, and was being carried out with judicious effect in the matter of old and dilapidated premises dangerous to the public. Time occupied in the investigation of these cases could not be unnecessarily bestowed. The owner or occupier was personally liable, and where neither could be readily found, it was required by the Act simply to affix a notice on the door of the dangerous premises complained of.

Ordered to be put in proper repair, or taken down within fourteen days.

LETCHWORTH MODELS AND PLANS EXHIBITION.—In reference to a remark in the article on Letchworth in our last issue, Mr. Aylwin O. Cave writes to say that the plans of his "Nurses' Convalescent Home" were sent there for exhibition along with the elevations, but that they had been temporarily removed for a special purpose.



Norman Chapel, Broad Campden. Plan.

Illustrations.

WESLEYAN CHURCH, GOSPEL OAK, N.W.

THIS church has recently been erected at the corner of Agincourt and Lisburne roads, Hampstead. Accommodation is provided on the ground floor and in the galleries for about 900 worshippers.

The general contractor was Mr. Coxhead, of Leytonstone; the heating was by Messrs. Purcell & Hobbs, of Cleveland-street, and the architect was Professor Beresford Pite. The total cost was about 7,000*l*.

THE NORMAN CHAPEL BUILDINGS, BROAD CAMPDEN, GLOS.

THE work on this building consists practically of three portions—the repair or restoration of the old building, the building of a new wing, and the laying out of a formal garden.

The first portion of the work was of singular interest. As the drawing will show, an old Norman church is its nucleus. The chancel arch, the south and north doorways, and some of the masonry of the earliest type still remain. A strange thing, however, happened in the XIVth century, probably in the reign of Richard II. This Norman church was desecrated and turned into a dwelling-house; a new wing was added and a floor taken across the nave of the church, the XIVth century windows and fireplace being built into the Norman work, and the chancel arch was cut through the middle by a heavy oaken floor. A fine new oaken roof was added at the same time. For some 350 years the house would seem to have been inhabited; after that it fell into ruin, and when it was recently reconstructed by Mr. Ashbee the bulk of the roof at the eastern end had fallen in.

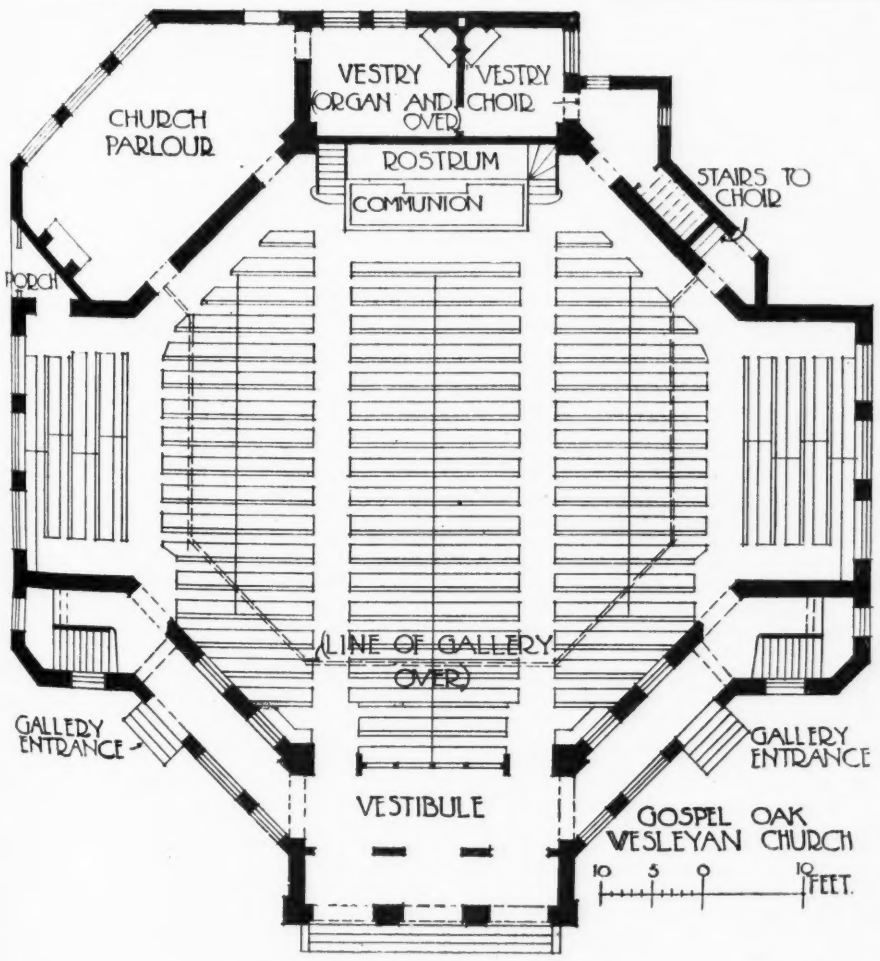
The perspective drawing shows the building as seen from the beautiful orchard within which it stands. A new terrace has been built on the south side, and the tall bow window giving light and sun to the dining-room and bedroom in the XIVth century wing is new.

The new wing is a continuation of the XIVth century wing. Like the new bow, it is built of brick and roughcast, with Gloucestershire stone slates, so as to harmonise and yet not compete with the stonework of the two earlier periods. In the new wing, which contains bedrooms, bathroom, servants' offices, and other accommodation, a heating apparatus has also been constructed, which warms the whole length of the building. The sills and frames of the windows and the doors for the most part are of oak, and the door into the dining-room out of the hall is oak inlayed with ebony and mother-of-pearl. A fine feature in the detail of the interior is the inlayed and damascened metal-work—silver into iron—which the owner has had made in Ceylon, and for which Mr. Ashbee has specially designed the doors in several cases.

The garden is at present under construction. It consists of a series of terraces with a kitchen garden at the top, and passing through successive stages—a lawn-tennis court, a flower garden, a pergola, and a circular rock garden—to a stream down at the bottom of the property.

"The general effect of the building," we are informed, "both externally and internally, is very fine, having the peculiar character of Cotswold stonework, not too sombre, but of that graciousness and delicacy which gives Gloucestershire work such an added charm to the similar stone building of the northern moors and hills. In the interior Mr. Ashbee has tried to obtain an effect of light and sun which it was difficult in a Norman church, with heaving black oak XIVth century panelled ceilings, to be sure of, but on the whole the effect has been got. The interior is further enlivened and made lovely by the wonderful collection of Sinhalese arts and crafts—embroideries, ivories, carvings—which the owner, Dr. A. K. Coomaraswamy, who is at present working upon a history of the arts and crafts of Ceylon, has gathered together. They fit singularly well into a very beautiful setting.

All the work in connexion with the building was done locally, and the restoration and



Gospel Oak Wesleyan Church. Plan.

more intricate portions were carried out for Mr. Ashbee by the workmen of the Guild of Handicraft."

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

THESE two plates are given in connexion with the Architectural Association excursion to Norwich and neighbourhood. Some notes on the buildings visited will be found on another page and in our last issue.

Builders' and Contractors' Column.

A NEW CONCRETE MIXER.

TWO EXAMPLES of the "Roll" concrete-mixing machine, which has recently been introduced into Great Britain by the Machinery Supply Company, are at present to be seen in working order at the Westminster Motor Works, 45, Horseferry-road, S.W. The larger machine is driven by belting from an electric motor, and is fitted with gear for operating the receptacles from which cement, sand, aggregate, and water are tipped into the mixer, and for opening the latter at the proper time so as to discharge the concrete into a barrow or truck placed beneath. The working parts of the apparatus are mounted on a strongly-built steel frame provided with a platform at one side, from which one man can easily control all the operations to be conducted. The machine is mounted on cast-iron wheels of diameter sufficient to permit it to be moved easily from place to place, and the guides carrying the charging receptacles are constructed so that they can be folded down, thus making it possible for the machine to pass under railway bridges or through covered passages when being transported by rail or road.

The mixing-chamber has the form of an oblate spheroid, consisting of two cup-shaped castings, rotating upon a horizontal shaft driven through spur gearing connected with the main driving pulley. One casting is keyed to the shaft, and its outer end has an opening through which the materials for making concrete are delivered by means of a shoot. The edge of the casting is recessed for reception of the edge of the second casting, which is connected with the shaft by a feather-key, providing for a horizontal movement of about 8 in. The edges of the two castings are turned so as to make a water-tight joint, and the second casting can be moved backwards and forwards along the shaft by right and left hand worms, either of which can be put in gear with the casting by a simple mechanical device. The interior of the mixing-chamber has projecting ribs for the purpose of securing the thorough admixture of the materials.

Cement, sand, and aggregate are raised from ground level by a hoisting arrangement attached to the machine and moving along vertical guides, and are tipped, together with water from a second receptacle, into the mixing-chamber. After the latter has been rotated for a sufficient time, its contents are discharged by causing the movable half to be drawn along the shaft, thus allowing the entire charge of concrete to fall into the truck placed below.

The apparatus is of substantial construction, and conveniently arranged, and the interior of the mixing-chamber can be cleaned very readily. It is stated that the machine is capable of turning out from 18 to 25 cubic yds. of concrete per hour, and that 4 h.p. are required for its operation.

So far as essential principles are concerned, the smaller machine on view presents no features of difference from the apparatus already described. The mixing-chamber has an output of from 2 to 3 cubic yds. per hour, and motive power is furnished from a large flywheel, which can easily be turned by one man. The manipulation of the tips for materials and water, and the opening and closing of the mixing-chamber, are effected by means of hand levers. This machine also is mounted on wheels of ample size to facilitate its transport from place to place.

SELF-SUPPORTING REINFORCEMENT FOR CONCRETE FLOORS.

In the erection of the Salvation Army building, New York, the contractors devised an ingenious system of self-supporting reinforcement for the concrete floors and roof, the idea being to combine the convenience of steel-frame construction with the permanent advantages obtained by embedding the steel-work in concrete. As the brick walls and cast-iron columns were carried up, light permanent steel beams were connected with them forming a skeleton with sufficient strength for bracing the columns and for supporting the concrete and centring used during the construction of the floors and roof. They also constituted the permanent reinforcement of the concrete against tensile stresses. It is stated that the saving effected over the cheapest class of fireproofing with the usual steel construction represents a saving of 20 per cent. on the cost of the complete floors and columns.

DRAUGHT-PREVENTER FOR DOORS.

A model of the patent "Durabar" draught-preventer, invented by Mr. A. R. Groome, A.R.I.B.A., has been sent for our inspection. It can be fitted to new and old doors, and can be either screwed on the face of the door, or let into a rebate to finish flush with the door. The mechanism is extremely simple. The draught-preventer itself is a flat piece of wood, a strip of felt or indiarubber being let into one edge, and a bar of iron being screwed on the other edge. Brass ends are attached to the ends of the wood bar, and are pivoted to brass plates screwed to the edges of the door. The pivots are placed in such a position that when the door is open the draught-preventer is overbalanced by the iron bar, and remains in a horizontal position clear of the floor. On closing the door, one of the brass ends engages with a curved brass plate attached to the lining of the door, and the draught-preventer is turned into a vertical position with the felt or indiarubber against the floor. There are no springs or projecting studs. The invention is simple and well-adapted for its purpose.

MISCELLANEOUS.

Messrs. Higginbottom & Mannock, Ltd., Crown Ironworks, West Gorton, Manchester, have received the order for eight electric passenger elevators, six electric goods lifts, and four hand hoists for the new Royal Infirmary, at present in course of construction in Manchester.

The Guardians of the Prestwich Union, Manchester, have placed the contract with Morrison, Ingram, & Co., Ltd., Manchester, for all the sanitary appliances for the new infirmary at Booth Hall. A portion of the sanitary appliances for the Manchester New Royal Infirmary have also been placed with the firm.

Competition.

ACTON MUNICIPAL BUILDINGS COMPETITION.—We wish to draw the attention of our readers to an advertisement, isued by the Royal Institute of British Architects' Board of Professional Defence, which appears in this issue amongst contract advertisements, page iv. The action of the Board will no doubt be appreciated by all architects, and the announcement to be made next week will be looked for with much interest. A vacation meeting of the Acton District Council was held on Tuesday. The principal business, says the *Tribune*, concerned the service of a High Court writ on behalf of Mr. W. G. Hunt, of Vicarage-gate, Kensington, claiming 875*l.* for professional services in preparing plans and drawings for proposed new municipal offices, respecting which the council have repudiated liability on the ground that there was no contract under seal.—Councillor Poulton expressed a wish to have the whole matter deferred and thrashed out at a special meeting, but the chairman (Mr. H. S. Schultess-Young, M.A.) declined to entertain any question of further delay, and said it was quite time the council refuted the false statements that they had not treated Mr. Hunt properly in the matter. Councillor Poulton thought the chairman had acted wrongly in sending a reply to the Board of Professional Defence of the Royal Institute of British Architects, their letter being addressed to the council.—The Chairman: "My statement was simply that the council were acting fairly towards Mr. Hunt, and I think it quite time somebody got up and said so." The Chairman added that when Mr. Hunt came to see him he explained the difficulty of the contract not being under seal, and asked if it was not a fact that the clerk advised it should be sealed. Mr. Hunt said that was so, but that Councillor Baldwin, the then chairman, said it had better not, that it would irritate the ratepayers, and had better be got through quietly. Asked whether Councillor Baldwin's son was not articled to him, Mr. Hunt replied, "Yes; I may say I took him without a premium, a thing I have never done before." Continuing, the chairman said he had written to Councillor Baldwin advising him to frankly disclose these business relations and state truly that he with others had always believed Mr. Hunt to be the man for the work, and that other matters had not biassed him, pointing out that by so doing he would remove the possibility of comment which otherwise might be unfavourable. He felt sure no member wished to press this matter home further, though he believed the universal opinion must be that no councillor should accept obligations from an intending contractor without fully disclosing them to his fellow-members and to the ratepayers. It was eventually decided that Messrs. Hemsley, solicitors, should be instructed to enter an appearance to the writ, and the whole matter left in their hands.

Books.

Portfolio of English Cathedrals. No. 32, Carlisle and Sodor and Man. With Historical and Architectural Notes by ARNOLD FAIRBAIRNS. (London: E. T. W. Dennis & Sons, Ltd. 1907.)

CARLISLE has, with the exception of the two bays adjoining the central tower, lost what must have been a very impressive Norman nave. The beauty of the presbytery, with its fine east window of nine lights, and the delicate stalls in the choir, more than compensate for the loss of the western limb. The Cathedral of Sodor and Man is now roofless—the lead having been removed in the beginning of the XVIIIth century. It forms the crowning feature of the pile known as Peel Castle, on an island lying off the town of Peel on the western coast of the island, and, considering the fact of its being the cathedral of the most ancient diocese in Great Britain, it can but be regretted that it could not be reroofed and brought back to something of its former condition and dignity. The photographs and notes in both cases are excellent: the two of the interior of choir and presbytery at Carlisle are particularly satisfactory.

Approximate Estimates: A Pocket-book for Estimating. By T. E. COLEMAN. Third Edition, Revised and Enlarged. (London: E. & F. N. Spon, Ltd., 57, Haymarket. 1907.)

THIS work, while containing a mass of information of the most diverse description, which would under different conditions be most useful, is very disappointing. Amongst other items that would be useful with more data are the prices given for executed works, but, as there is no indication as to the date of their execution, the prices given are of little value. This is all the more strange, as the author makes a strong point of the great increase in prices, giving as instances 50 per cent. increase in twenty years, 28 per cent. in two years, and 60 per cent. in twelve years, winding up with a general opinion that "the cost of building has increased by about 25 to 30 per cent. within the last ten years." Yet, with all these statements in the chapter on "The Preparation of Estimates," the examples given include the Manchester Assize Courts, Claybury Asylum, Holborn Viaduct Hotel, British Museum, Holborn Town Hall, Portsmouth Town Hall, Foreign Office, and Houses of Parliament. These are interesting, but in a work such as this, to be of any value for comparison or as a guide to the cost of similar buildings, the dates of erection should be given.

We think the usefulness of the work would be greatly increased if some of the "wider" items were eliminated. To take examples at random, it cannot be much guide in estimating to be told that boat canals cost from 12,000*l.* to 25,000*l.* and ship canals from 150,000*l.* to 250,000*l.* per mile, or, as in the "actual cost" items, the example of the Bridgwater Canal,

length thirty-four and a half miles—no note as to depth or width, or date of construction—6,800*l.* per mile.

The description of bay windows on page 62 would not convey anything very definite to the majority of readers, yet the author gives "firm" prices for these in brick and stone, with the difference between 1½-in. and 2-in. sashes. He is also very fond of distinguishing between "plain" and "ornamental," as in the prices for "Campaniles." This distinction may mean anything.

We still notice those curious little items which are sandwiched between the larger ones, *e.g.*, 1-in. by 1-in. and 1½-in. by 1½-in. deal balusters: limewhiting—one and two coats—and so on. These appear somewhat ridiculous, associated as they are, with tremendous inclusive items.

We have hitherto been rather severe in our criticism of the work, but we think the examples selected amply justify this position. At the same time, it is only fair to the author to say that he has amassed a great amount of information, which only wants rearranging and in some cases somewhat amplifying or eliminating altogether to make the book a most useful work of reference. The notes on the "Preparation of Estimates" are ample and practical, and taken in conjunction with some of the information given—if the reader will only take the trouble to sift that which is useful from that which is merely interesting as a record—will be found of great service.

The Quantity Student's Assistant: A Handbook of Practical Notes and Memoranda. By GEORGE STEPHENSON. (London: B. T. Batsford. 1907.)

THIS work is well described as a handbook of "practical" notes, as the information given is in the highest degree practical, and largely consists of "reminders" that will be appreciated by those who have passed the student stage. As a work of reference it has one drawback, and that is that there is no subdivision beyond that of the headings of the various trades, which makes it somewhat difficult to strike the particular item to be referred to, as the book is practically continuous from cover to cover. The number of times the word "remember" occurs points out the great necessity of method in the quantity surveyor's practice, and this is well emphasised in this unassuming work.

Surveying, Including Land and House Surveying, Valuations, Dilapidations, etc. Edited by HUGH B. PHILPOTT. (London: John Dicks Press, Ltd.)

THIS is one of the "Illustrated Carpenter and Builder" technical manuals, mainly written by Mr. Herbert Challey, B.Sc. (Engg.), and Mr. F. T. Barnes Hewitt, F.S.I., with a chapter on "Making a Sanitary Survey," by Mr. Edmund Page, P.A.S.I. Considering the fact that the work covers far more ground, and, at the same time, is much smaller than any other text-book on surveying, the reader cannot expect anything like exhaustive treatment. Nevertheless, in the first fifty-five pages Mr. Challey has managed to deal very usefully with the elements of practical land surveying, and Mr. Hewitt has been equally successful in dealing with building surveys. The third author has not been treated quite fairly in being asked to crowd his subject into three pages of letterpress, a circumstance which probably accounts for the exceedingly adumbrative manner in which sanitary surveys are discussed.

Transactions of the Institution of Civil Engineers of Ireland. Seventy-first session. 1904-5.

THIS volume suffers in some measure from the fact that the papers reprinted were actually read and discussed two or three years ago, and it is to be hoped that the Council of the Institution will endeavour to bring the record of their proceedings up to date with as little delay as possible. Notwithstanding the disadvantages inseparable from tardy publication, several of the papers in the present volume are quite worthy of study to-day. In describing "Recent Works of Sea Defence at Penzance," Mr. Frank Latham gives the results of an extended series of tests on the cohesive strength of cement and concrete, the most interesting point about these being the demonstration afforded of the advantage to be derived from the addition of truss to mortar for use in sea water. In a brief note on "The Most Economical Span for Long Girder Bridges," Dr. Bindon B. Stoney, F.R.S., gives a simple proof of the rule to which attention was first drawn by Mr. Liddell, the engineer of the Crumlin Viaduct; and the reader will find a well-considered contribution by Mr. W. Kaye-Parry, M.Inst.C.E., dealing with sewage purification.

The Workmen's Compensation Act, 1906. *Handy Notes for Employers.* By A. F. O. WALBROOK, Solicitor. (London: Fleet Printing Works.)

THE object of this pamphlet is to acquaint persons with the general provisions of the Workmen's Compensation Act, exclusive of proceedings subsequent to the accident. The material sections of the Act are paraphrased, and the author has succeeded in explaining the general scheme of the Act in a very small compass. The limits of a pamphlet do not allow of any discussion of the complicated problems this Act affords. Thus the author makes the general statement that all persons are entitled to compensation except the classes specifically excepted, a statement which begs the question now occupying public attention as to what persons will be deemed "workmen" within the Act. The author's interpretation of the section limiting the time for taking proceedings also appears rather too liberal, but the pamphlet attains its object, and is clearly expressed.

The Employers' Liability Act, 1880, *and the Workmen's Compensation Act*, 1906. By ALFRED HENRY RUEGG, K.C. Seventh Edition. (London: Butterworth & Co. 1907.)

THE noticeable part of the new edition of Mr. Ruegg's well-known and well-proved work is the addition of the Workmen's Compensation Act, 1906. The decisions on the Employers' Liability Act, 1880, are also brought up to date. Among many careful works on this important subject not one has a higher reputation than this book, and its author is so frequently retained in cases on this subject that he has better opportunities than most of following out the working of the Act.

The Law of Trade Unions. Being a Text-book Concerning Trade Unions and Labour. By T. SETON JEVONS, B.A., Barrister-at-Law. (London: Effingham Wilson. 1907.)

THIS little volume is one of a series of popular text-books, and it is stated in the preface that its principal object is to provide the officers and members of trade unions and workmen generally with a means of obtaining some knowledge of the law governing trade unions. The various Statutes and Statutory Regulations are set out in the text and the legal decisions are referred to in the notes, but the work as a whole appears a little disconnected. Allowance has, however, to be made for the inherent complexity of the subject.

Haworth's Practical Timber Measurer and Timber Buyer's Tables. 1907 and 1908. (London: Alfred Haworth & Co. 1907.)

THIS is a very modest little work issued from the *Timber News* offices. While ostensibly for timber buyers in particular, the information contained will be found of value to those who have even a very remote connexion with the timber market. In less than fifty pages there is practically everything that can be told with respect to the measurement of timber, in the form of tables and examples, the description of the various "standards," and the equivalents both in prices and quantity of boards, quarterings, etc., per standard and per foot cube, superficial or lineal, as the case may be. Altogether this will be found a very useful little work.

ROMAN CATHOLIC CHURCH, SPIDDAL, COUNTY GALWAY.—The dedication of the new church at Spiddal took place on the 18th inst. The architect of the building is Mr. William Scott, of Dublin, and Messrs. Thomas Griffin & Son, of Galway, are the builders.

BOOK RECEIVED.

THE PALACE OF PEACE AT THE HAGUE. (The Six Premiated and Forty other Designs Chosen by the Society of Architecture at Amsterdam, and Reproduced under its Direction.) In Eight Parts. Parts IV. and V. 10s. 6d. net each part. (London: T. C. & E. C. Jack, Henrietta-street.)

Correspondence.

LETCHWORTH COTTAGE EXHIBITION.

SIR,—In your article of August 17 on the Cottage Exhibition at Letchworth I find that you have credited me with being the architect of two of the houses you commend—Nos. 219 and 220.

The fact is I am merely the owner, the houses having been designed by Messrs. Bennett & Bidwell, of Letchworth.

You have probably been misled by the exhibition catalogue, in which the name of the architects is in this case unfortunately omitted.

R. T. HEYS.

THE ZODIAC ON GREEK COINS.

SIR,—In my mention of the zodiac on coins and medals generally, I made no reference to the signs as found on coins of Attica and Greece proper, as there was no room, and their peculiarity seemed to require special notice. The number of ancient Greek coins also is extremely great, and the types are almost equally numerous, the variations of one design being extensive. Instead therefore, as hitherto, of detailing each example, I have had to group them topographically, so that each number represents scores of examples bearing the same sign, yet not of the same die.

But, as far as I know, these emblems on Greek coins have not been considered as zodiacal, but there are considerations which seem to lead logically to that conclusion. In agreement with the interesting letter by "D. M.," the evidence points to the zodiac having been obtained by the Greeks from Egypt, and practically they had it from the first, so that it was of great antiquity among them, and held in the highest veneration. The Greeks being essentially a religious people, their official and national emblems would be religious also. But from what part of their mythologic system can we derive these (zodiacal) emblems except from that zodiac which they looked up to with the greatest religious awe? Their mythology itself was in a great measure founded on the zodiac. Their 12 gods have been derived from the 12 signs, and the 12 labours of Hercules (himself one of the decans) clearly refer to the labour of the sun through the 12 signs. (Rolleston: "Mazzaroth," ii., 83, 88.) Roman mythology was practically derived from Grecian, and a greater part of the "Metamorphoses" of Ovid consists of the adventures of the constellations, treated as actual beings. As to not finding the conventional zodiac in an arc (such as we almost invariably see it) on Greek coins, it appears that Hipparchus (B.C. 130) was the inventor of this form, so that we could only expect to find the zodiac as detached signs, one or two on a coin; in fact just as it is here suggested we do find them.

That single signs were placed on coins is seen by those on the Indian mohurs (*Builder*, No. 3346, p. 369, No. 1), therefore the Greeks (who, according to Max Müller, introduced the zodiac into India) may naturally have done the same. But on the Greek coins themselves are emblems which can only be explained by reference to the zodiac. Thus the extraordinary emblem of half a bull appears on some (see Nos. 8, 56). On referring to the Astronomical Atlas (Jamieson, Flamsteed, Gall, etc.) it is seen that Taurus is merely the forepart of a bull, there being no stars to designate the hinder half. On other coins is seen the forepart of a goat (see No. 58); and so in the zodiac, Capricornus only contains half a goat. Another Greek emblem is a fish-goat, which is exactly the correct form of Capricornus, on astronomical atlases, globes, and planispheres. Such an emblem, too, as the Scorpion in Greece, is unintelligible, except by reference to the Scorpio of the zodiac. But the subject is too lengthy to enter upon fully.

The Greek coins mentioned in this letter all formed part of the great Bunbury collection, and are described in Sotheby's sale catalogue of them, 1896, the numbers at the end of each referring to the catalogue lots.

In the catalogue some of the emblems are described by their zodiacal names, as Pegasus, Sirius, etc. Many of these constellations being decans confirms the conclusion that the (36) decans are as of great antiquity and authority as the (12) signs.

1. *Athens.*—Various silver tetradrachms of this city, struck B.C. 590-525, bear the following emblems, the corresponding zodiacal signs being in brackets—Olive spray (held by Hercules), two serpents (Draco, Hydra), crescent (Luna), griffin (Leo, Aquila), amphora (Aquarius), pilei of Dioscuri (duo gœsa of Gemini), rudder (? Argo), star (Cynosura), two torches (*cf.* two torches held by Gemini in all Mithraic zodiacal tablets). B.C. 220, Cornears (Spica in Virgo). B.C. 196, Club, lionskin (Hercules), bow-case (Castor), Pegasus, Eros (Coma), Helios (Sol), bow (Castor), kantharos (Crater), forepart of lion (Leo), eagle (Aquila), vase (Crater). *Post* B.C. 196, trophy on prow (? Argo), galley (Argo), two nude figures (? Gemini), Gorgon head (Perseus), dolphin (Delphinus), tripod (Ara), serpent (Ophiuchus), anchor (? Argo). Bunbury Catalogue, Nos. 970, 975, 988, 990, 993, 1000, 1008, 1013, 1017, 1019, 1021, 1024, etc.

2. *Athens.*—Bronze coins, *post* B.C. 220. Serpents, amphora, bucranium (Taurus), prow serpent Minotaur (Taurus, Aquarius), two torches, Sphinx (Leo, Virgo), tripod, Herakles, lion-skin, lyre (Lyra), galley, urn (Aquarius). B. 1032–1037. Besides the above the following non-zodiacal emblems are found on Athens coins, viz., owl, cock, tree, pig, trident (1 Samuel, ii., 13).

3. *Megara.—Ante* B.C. 338. Five crescents, three crescents, lyre. B. 1038, 1039. Silver.

4. *Ægina.*—Silver. Dolphin, row of pellets (? Pleiades in Taurus), two pellets (? Castor, Pollux), tortoise. Pellets in some ancient designs undoubtedly stand for stars. B. 1040–1045.

5. *Eleusis.*—Bronze. Lyre, tripod, torches, prow, ram-head (Aries), dolphin, dolphins (Pisces), pig (in the Dendera stone planisphere Ursa Major is a pig). Cole: "The Zodiac of Tentyra." 1824, plate). B. 1046, 1047.

6. *Corinth.*—Silver staters. *Circa* B.C. 600–500. Pegasus, tripod, dolphin, candelabrum (? *Libra*—in a Babylonian sculpture libra is a lamp. Brown: "Celestial Equator of Aratos," p. 466), two dolphins, ox-head (Taurus), lituus (crook in Bootes), bucranium, head wearing Phrygian cap (in the Mithraic tablets, Castor, Pollux, and Perseus wear this cap, so do Castor and Pollux on Roman coins, medals, and sculptures), prow, quiver, Nike holding serpent (? from Ophiuchus), Helios, dog (Sirius), bird (Corvus), Herakles, chimæra (Leo, Capricornus, Draco), cornear, wolf (Lynx), eagle, Gorgon, chimæra. B. 1048–1065.

7. *Corinth.* — Bronze. Pegasus, chimæra, eagle, dolphin, lioness, ram. B. 1066, 1067.

8. *Pellene.*—Silver. Bull, bird, forepart of bull. B. 1068.

9. *Phlius.—Circa* B.C. 430–322. Bull. B. 1069. Silver.

10. *Patræ.*—Bronze. Herakles. B. 1070.

11. *Phlius.*—Bronze. Bull; five dots. B. 1070.

12. *Achæan League.*—Silver. Fish (Piscis Australis), half goat, wolf-head, Pegasus, serpent, pilei, lyre, dolphin, vase, dove. B. 1071–1073.

13. *Sicyon.*—Silver staters. Chimæra, dove (Turdus Solitarius ?), dolphin, three pellets, bird, kneeling figure with bow (Engonases Hercules). B. 1074–1080.

14. *Sicyon.*—Bronze. Dove, tripod, chimæra, Serapis (Joseph deified. Vossius). B. 1081.

15. *Elis.* — Silver staters. B.C. 480–420. Eagle, hare (Lepus), serpent, bird, Nike with wings and palm (in some ancient zodiacs Virgo has wings, Palma in Virgo). B.C. 362–312. Bull's head. B. 1082–1101.

16. *Elis.*—Bronze. Eagle, serpent. B. 1102.

17. *Cranium.*—Silver. B.C. 500–430. Ram, bow, pellet (? Castor), forepart of ram, ram's head, ram's foot. B. 1103.

18. *Cranium.*—Bronze. Ram, bull's head, ram's head, bow. B. 1104.

19. *Proni.* — Silver. Ram, club (Pollux), tripod. B. 1106.

20. *Zacynthus.* — Silver staters. Tripod, drachm, crescent. B. 1107, 1108.

21. *Pale.* — Bronze. Dolphin, corngrain, Herakles, club, dog, bull's head, prow, tripod, quiver, star, Pegasus, eagle. B. 1109.

22. *Messenia.*—Silver tetrobol. *Post* B.C. 280. Tripod. B. 1110.

23. *Messenia.* — Bronze. Tripod, branch, cornear. B. 1111.

24. *Lacedæmon.* — Silver. Amphora, pilei. B. 1110.

25. *Lacedæmon.*—Bronze. Eagle, heads of Dioscuri, two amphora (some ancient zodiacs have two vases for Aquarius), Herakles, club, Dioscuri, caps of Dioscuri, Dioscuri with horses, dove, altar. B. 1112, 1113.

26. *Argos.*—Silver staters. *Circa* B.C. 550. Two dolphins, wolf, tripod, quiver, forepart of wolf. B. 1114–1120.

27. *Argos.*—Bronze. Wolf, club, serpent. B. 1122.

28. *Hermione.*—Bronze. Wolf head, torch, quiver, club, tripod, palm tree (as on Mithraic Tablets). B. 1123.

29. *Trœzen.*—Bronze. Dog, tripod. B. 1124.

30. *Arcadian League.*—Silver triobols. B.C. 550–420. Eagle. B. 1126.

31. *Alea.*—Silver obol. B.C. 430–370. Bow (Castor). B. 1127.

32. *Cleitor.* — Silver obol. B.C. 400–320. Helios, bull. B. 1127.

33. *Megalopolis.*—Silver triobol. B.C. 300 Eagle. B. 1127.

34. *Tegea.*—Bronze. Medusa head (Gorgon) in vase (Crater). B. 1135.

35. *Mantinea.*—Silver triobol. B.C. 500–400. Bear (Ursa Major). B. 1128.

36. *Heræa.*—Silver triobol. B.C. 550–500. Gorgon head. B. 1129.

37. *Pheneus.*—Silver obol. B.C. 400–360. Ram. B. 1129.

38. *Pheneus.*—Silver triobol. B.C. 400–362. Bull. B. 1131.

39. *Stymphalus.* — Silver obol. Herakles' head, bird's head. B. 1132.

40. *Tegea.*—Silver triobol. *Post* B.C. 370. Olive branch. B. 1132.

41. *Cleitor.*—Bronze. Head of Helios. B. 1133.

42. *Heræa.* Bronze. Dog, bow. B. 1133.

43. *Orchemenus.*—Bronze. Altar (Ara). B. 1134.

44. *Pheneus.*—Bronze. Ram, horse. B. 1134.

45. *Allaria.*—Silver tetradrachm. *Circa* B.C. 200. Herakles' club. B. 1136.

46. *Axos.*—Silver half-stater. B.C. 400–300. Tripod. B. 1140.

47. *Chersonesus.*—Silver stater. B.C. 350–300. Club, lyre, Herakles. B. 1141.

48. *Cnossos.*—Silver staters. B.C. 500–430. Minotaur, star, five pellets, bull's head. B. 1143–1160.

49. *Cydonia.*—Silver staters and drachms. B.C. 400–300 and 200–100. Dog, archer (Sagittarius), quiver. B. 1161–1167.

50. *Elyrus.*—Silver drachms. B.C. 400–300. Goat's head (Capricornus), arrow head (Sagitta), bee. B. 1172.

51. *Gortyna.*—Silver stater. B.C. 480–200. Bull, lion scalp, three pellets, bull and tree (as in Mithraic Tablets), eagle, bird, dolphin, archer. B. 1173–1186.

52. *Hierapytna.* — Silver didrachms. *Circa* B.C. 200. Eagle, goat, arrow-head, lyre. B. 1187–1191.

53. *Itanus.*—Silver stater. B.C. 480–300. Star, pellets, sea monster (Cetus), eagle, boar's head. B. 1192–1198.

54. *Lyttus.*—Silver staters. B.C. 450–300. Eagle, boar. B. 1199–1205.

55. *Moda.* — Silver staters. Bull's head. B. 1206.

56. *Phæstus.*—Silver staters. B.C. 431–300. Herakles, club, bow, lion's skin, four globules, bull's head, serpent, Hydra, crab, bow and quiver on a tree (as in Mithraic Tablets), forepart of bull. B. 1207–1217.

57. *Polyrhenium.*—Silver staters, etc. B.C. 330–200. Bull's head, fillet. B. 1220–1223.

58. *Præsus.*—Silver staters and drachms. B.C. 450–300. Man kneeling with lion's skin on arm (Orion with lion's skin), bow, eagle, bird, bull, forepart of goat, arrow-head, dots, rose, bee. B. 1224–1230.

59. *Priansus.*—Silver staters and drachms. B.C. 430–300. Serpent, date palm (as in Mithraic Tablets), dolphin, rudder. B. 1231–1232.

60. *Tylissus.*—Silver stater. B.C. 400–300. Goat's head, bow, arrow-head, laurel branch. B. 1235, 1236.

61. *Crete.* — Attic didrachm. Man-headed bull, bull's head, seven stars, stars. B. 1237–1242.

62. *Arsinoe.* — Bronze. Two dolphins. B. 1243.

63. *Axus.* — Bronze. Tripod, fulmen. B. 1243.

64. *Chersonesus.* — Bronze. Dove, prow, B. 1243.

65. The bronze coins bear the same emblems as the silver, viz., tripod, dog, club, lyre, bull, eagle, boar, bow, quiver, arrow-head, two dolphins, palm, trident. B. 1244–1246.

Nos. 45 to 65 are Cretan coins.

66. *Carthæa* (Ceos).—Silver hemi-drachm. *Circa* B.C. 500. Amphora. B. 1247.

67. *Coresia.* — Silver hemi-drachm. *Circa* B.C. 500. Dolphin. B. 1247.

68. *Naxos.*—Silver stater. *Circa* B.C. 550. Amphora, eagle. B. 1249–1251.

69. *Delos.*—Silver stater. *Circa* B.C. 550. Lyre. B. 1248.

70. *Paros.*—Silver didrachm. B.C. 200. Goat. B. 1252.

71. *Tenos.*—Silver didrachm. B.C. 300–200. Dolphin. B. 1254.

72. The nos. 66 to 71 are coins of the Ægean Islands, and the bronze series of this coinage bear the same emblems as the silver, viz., Kantharos, vase, dolphin, palm, bull, forepart of dog (Sirius radiate), star, lyre, kneeling goat, cornear, Gorgon, harpa, eagle, trident, flying eagle.

73. *Cleone.*—Silver obols. Vth century B.C. Herakles, torch. B. 1121.

The Nos. 8 to 12 are of cities in the Peloponnesus. Nos. 17 to 21 are cities in the islands off Elis. Nos. 30 to 44 are cities in Arcadia.

D. J.

The Student's Column.

MODERN METHODS OF USING GAS.—VII.

Shop Lighting.

LIGHTING SHOP WINDOWS.—The method of lighting shop windows by placing amongst the goods exhibited for sale a number of dazzling, unshaded lights is still commonly adopted, but is being gradually superseded by methods less barbarous. It is true that brilliant lighting is attractive to the general public, but the objects which should arrest the eye shou'd be the goods displayed, and not the lamps used for illuminating the goods. Furthermore, although a blinding glare may tend to attract people from a distance, it becomes an irritant at close quarters, and is not good lighting.

Concealed Lamps.—With the exception of those windows in which lamps in operation are exhibited for sale, and those which have no glass front, the most satisfactorily lighted windows are those in which the articles for sale are exposed in a good light of uniform intensity, and in which no lamp is visible to a person viewing the articles from the street. Lighting of this description may be obtained by the use of concealed overhead incandescent burners fitted with suitable reflectors (Fig. 16), or by lamps located in the street and which cast their beams through the window glass (Fig. 17). Lamps of the latter description should be provided with reflectors on the side facing the road, so that as much light as possible shall be thrown towards the window, and little or no light cast upon pedestrians (Fig. 17).

Unscreened Outdoor Lamps.—The Corporation of the City of London adopted the following rule, relating to outdoor shop lamps, in December last:—

Lamps for Shop-window Lighting.

"The underside of any portion of a lamp for shop-window lighting shall not be less than 8 ft. from the pavement level, the extreme projection over the public way shall not exceed 3 ft. when the width of the footway permits, and not be less than 2 ft. from the carriageway. The external dimensions of such lamp shall not exceed 2 ft. 3 in. in any direction, and shall not be fitted with high-power lights *unless screened in such a manner as to prevent the rays of light falling upon the public ways.*"

Judging from the appearance of the lamps to be seen outside some of the shop windows within the City boundaries the Corporation do not appear to have enforced obedience to their regulation, but it is a step in the right direction that so important a controlling authority should have recognised, by making this regulation, that the dreadful glare to which the public way is in some places exposed is a nuisance. Those who delight in garish lighting should be required to confine their illuminations within their own boundaries.

Ventilation of Shops.—To prevent the glass of a shop window from becoming obscured under certain conditions of the atmosphere by condensed water-vapour it is a good practice to provide adjustable ventilators or an adjustable ventilating grid (Fig. 16) near the top of the shop front. This is especially necessary in the case of restaurants and tea-shops. In shops of the latter description it is a common practice to provide gas burners near the bottom of the window, and fairly close to the glass, with the object of producing an up-current of heated air, and keeping the glass sufficiently warm to prevent it from acting as a condenser for the water-vapour in the atmosphere of the shop. These burners are only required under certain atmospheric conditions, and are often out of action for a considerable period. They are usually required in frosty or very wet weather. It is necessary that the ventilator should be adjustable in order to prevent the gas burners from being exposed to a strong draught when the wind happens to be blowing in an unfavourable direction.

Windows Filled with Inflammable Goods.—Shop windows in which goods which readily catch fire are exhibited may be lighted by outside lamps alone. With lamps of the

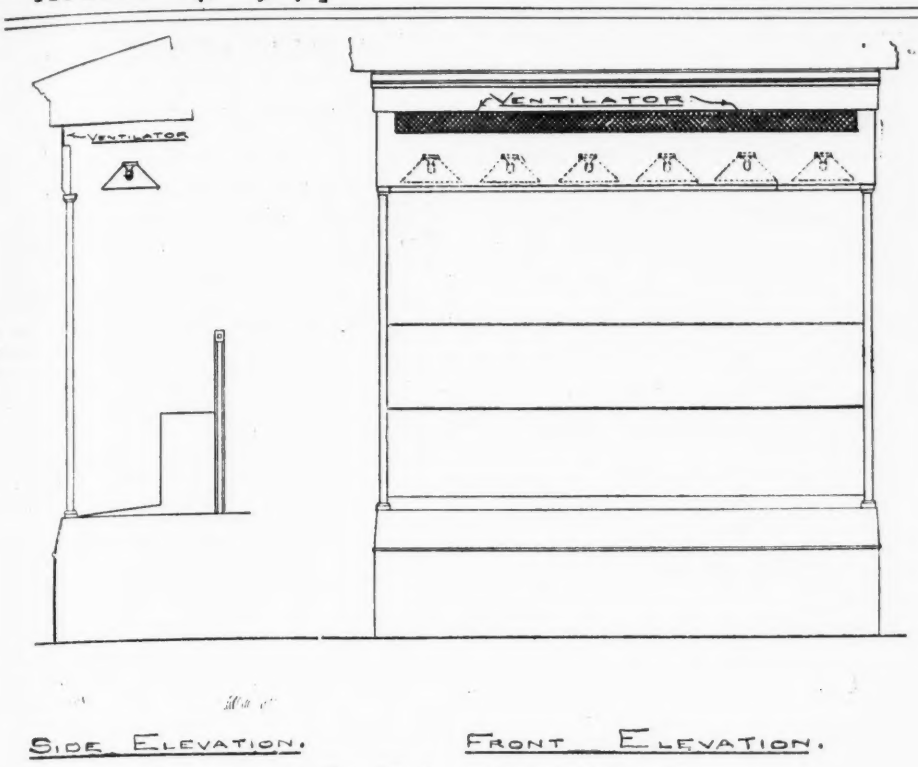


Fig. 16. *Shop Window with Concealed Lamps.*

form shown in Fig. 17 the whole of a shop window may be well and uniformly lighted.

Lamps for Shop Interiors.—The form of gas burner selected for lighting the interiors of shops should vary with the description of the shop to be lighted. Lamps suitable for lighting a jeweller's establishment are not necessarily equally suitable for use in a greengrocer's shop. For most small shops ordinary domestic inverted burners, provided with a by-pass and fitted with opal reflectors, or

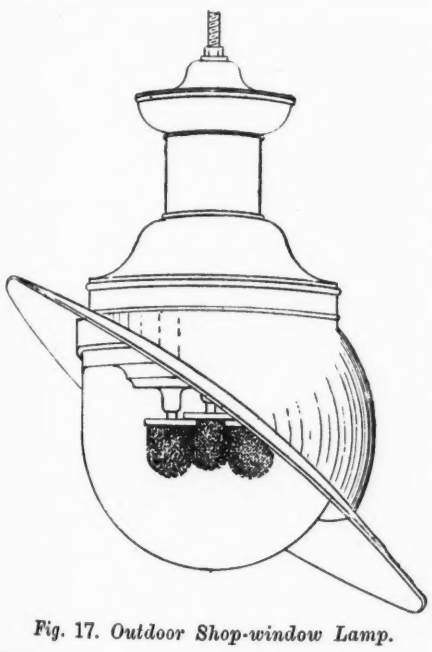


Fig. 17. *Outdoor Shop-window Lamp.*

with clear glass globes the upper parts of which are coated with opal, are suitable. For large and lofty shops high-power self-intensified lamps of the Lucas type may be used, or a compressor to supply high-pressure gas may be installed. When selecting the position to be occupied by a high-power lamp it should be remembered that to obtain light of 500 candle-power the gas must be consumed at a rate of about 15 cubic ft. per hour, and that the lamp will therefore emit much heat.

BREWERY OFFICES, DUNFERMLINE. — The Albany Works of Messrs. R. E. Walker, Reid, & Co. are to be enlarged by the addition of a new block, which will consist of showrooms, general offices, designing department, and private rooms. The plans for the proposed work are being prepared by Mr. James Shearer, jun., architect.

SCHEME FOR A NEW PORT AT FRANKFORT.

MR. OPPENHEIMER, British Consul-General at Frankfort, in his annual report to the Foreign Office, observes that the Central Frankfort Station was built barely twenty years ago at a cost of 1,250,000*l.* It still holds its own as a model establishment, but though built on a scale to provide for the growing traffic of the next fifty years its accommodation has already to-day proved insufficient. Perhaps (he proceeds) such facts illustrate more clearly than statistical tables the rapid and unexpected advance in many branches of German life. It was suggested that the east-end station of Frankfort, which had for many years stood neglected, should be extended to divert some of the traffic. The Prussian railway administration was slow in taking up the suggestion, but in connexion with a larger scheme its hands are now being forced. As the Frankfort river port on the Lower Main can no longer cope with the steady growing traffic the east-end (upper river) station is to be rebuilt in connexion with a vast upper river port. The completion of this port as now designed will entail for the city of Frankfort a total expenditure of 57,420,000 marks. The site selected for the port on the Frankfort side of the Main and in the east of the town measures 4 kilometres in length with an average width of 900 metres ; it presents an area of about 350 hectares. As these parts in the neighbourhood of the town are occasionally visited by inundations they had until to-day practically remained free from building. For the purchase of this site, now to be partly dammed in, about 22,000,000 marks will be required (included in the above estimate). The sale of property will realise, it is hoped, 39,000,000 marks, so that eventually the expense to the town will amount to only 18,000,000 to 20,000,000 marks. As an agreement has been reached with the railway authorities the eastern station and the eastern port are to be constructed simultaneously. It is hoped that the work may be begun in 1907, the first part of the port scheme to be completed by 1910, which would enable the use of the port. In 1915 the second part is to be undertaken, to be completed two years later. The port is intended to provide accommodation for the traffic and storage for the various classes of goods—above all, more space than can at present be given is to be provided for coal and other goods in bulk. There is also need for haven and storage accommodation for rafts and wood. Industry at large is to find at its disposal suitable sites within the *rayon* of the port, for at present industry has not developed in proportion to the development of the town, probably because the necessary sites were not available, or if available were found too expensive. Nor could until now the necessary connexion with the railways be everywhere established ; the supply of suitable river sites, on the other hand, had been exhausted. Such establishments, for which the traffic by water plays no great part, will in future be accommodated by sites easily connected with the port by the necessary sidings and roads. The whole plan then embraces : (1) A commercial port with (*a*) coal wharves, (*b*) general wharves ; (2) a port for rafts with storage room for wood ; (3) an industrial port ; and (4) an industrial district within easy reach of the port. The port itself is to be constructed in two separate parts, which are separated by the main road and bridge to Offenbach. The eastern railway-station of Frankfort will become the natural station of this port. It has direct communication towards the east end ; by a suburban connecting-line connexion is effected with the lines running north, west, and south. In case this connecting-line should not be able to bear the strain the railway administration contemplate a direct connexion at Vilbel with the main line running south ; for this purpose a new bridge will be built across the Main. The development of the commerce of Frankfort since the opening of the lower river port, which has now become insufficient, seems to justify the great financial sacrifice which the new scheme of an upper river port entails. The receipts will be made up from dues levied for the use of the port sidings, and for the transport of goods from and to the station within the port district, from fees for work done, such as loading and unloading of vehicles and trucks, weighing, etc., from fees levied for over-wintering, from wharf dues, from sales of sites, and the letting of storage room, etc.

General Building News.

NEW [CHURCH, SALTAIRE, SHIPLEY.—The Bishop of Knaresborough, on the 10th inst., laid a memorial-stone in connexion with the erection of a new church for the Saltaire portion of the Shipley parish. The church now in course of erection will have accommodation for 600 people. It will consist of a nave, 24 ft. by 74 ft., with north and south aisles, each 10 ft. wide. Beyond the aisles there will be shallow transepts 29 ft. wide. The chancel will be 37 ft. long and 22 ft. wide, with a chapel on the north side, 23 ft. by 14 ft. 6 in., for week-day services, etc. Vestries for clergy and choir and an organ-chamber will be constructed on the south side of the chancel. No tower will be erected at present. The contracts at present let amount to 6,000*l.*, and a tower would cost about 1,800*l.* more. The architects are Messrs. T. H. & F. Healey, of Bradford.

PARISH CHURCH, SWANAGE.—Messrs. Clifton & Robinson, of Swanage, are appointed architects for the enlargement and improvement of the parish church. The plans provide for the addition of a new nave on the north side to contain 350 more sittings, and thus to increase the total capacity to 1,000 seats. The Church Lands Trustees will subscribe 1,000*l.* towards the cost. The church, dedicated to St. Mary the Virgin, was originally built as a chapel to the vicarage of Worth Matravers, and was made parochial in 1500. It is believed that the tower was built as a watch-tower when the coast was liable to predatory attacks. The body of the church is more modern in date.

HENDON PARISH CHURCH.—Adverting to our recent announcement in respect of the untoward condition of the tower, we learn that Mr. Temple Moore, to whom is entrusted the preparation of plans for an enlargement of the church, recommends that one of the battlements should be rebuilt forthwith and that bands of cement should be put around the tower in order to ascertain whether any movement is taking place.

ST. NICHOLAS CHURCH, PLUMSTEAD.—A fund is opened for the reparation and enlargement, at an estimated cost of 8,000*l.*, of Plumstead parish church, which suffered damage by the explosion at Woolwich Arsenal in last February. The roof of the church fell in early in the XVIIth century, and the fabric was left in a ruined state during some twenty years or so. Then one John Gossage, using the old walls, erected a new church, which gave place some years ago to a restoration in part of the original fabric. The tower of red brick, mellowed in tint by age, at the west end of the north aisle is a typical example of its period, being Gothic in proportions and outline, rising in three stages, and having battlements upon the parapets and the angle turrets, but with Renaissance detail in the moulded brickwork of the window dressings and the cornices.

NEW CHURCH, DRUMBERG, DUNMURRY.—The foundation-stone was recently laid of a new church which is being built at Drumberg. The building is to be of stone from the Scrabo Quarries at Newtownards, built in rubble masonry, with smooth margins to the quoins and buttresses, and dressed stonework round the windows and doorways, also for the window mullions and the internal arches. The interior will be nearly 90 ft. long and 37 ft. wide, and is entered through the porch, which forms the base of the tower at the south-west corner. The woodwork is to be of pitch-pine, and the roof to be covered with Westmorland green slabs. An organ chamber is to be provided, and the building will be heated with hot water and lighted with acetylene gas. The builders entrusted with the work are Messrs. Robert Corry, Ltd., and the architects are Messrs. Blackwood & Jury.

CHURCH IMPROVEMENTS, CARLISLE.—Christ Church has been re-opened on the completion of a number of alterations in the building. The interior has been repainted deadened green, and the windows have been partly darkened so as to spread a subdued light. This work was carried out by Mr. W. N. Ballantyne, Carlisle, after a scheme devised by Messrs. Watts, London, who supplied new drapings for the sanctuary in crimson and gold. New altar rails to match the chancel screen have been supplied by Mr. Reed, Carlisle, while the mauve and gold panels in the chancel were designed and executed by Mr. Simpson, Carlisle. A new altar cross, made at the Keswick Art School, has been placed in the church. Additional electric lights by Mr. Kettridge, Carlisle, and a new heating apparatus, boiler, and radiators, supplied by Mr. Corbett, have been introduced; and the organ has been moved from its old position in the gallery above the entrance to the church to a side position in the gallery near the chancel under the direction of Messrs. Harrison & Harrison, Durham. Mr. Benwell, of Carlisle, was the architect, who supervised the whole of the work and designed the altar rails.

CHURCH RESTORATION, GREAT HENNY.—The restoration of the Great Henny Church has been completed, at a cost of over 600*l*. The principal features of the scheme have been the rebuilding of the vestry and organ chamber and of the tower arch. The spire has also been reshingled, the interior of the building has been replastered, and oak panelling has been placed all round the nave. The architect was Mr. F. W. Chancellor, of Chelmsford; the builders were Mr. W. Parmenter, of Braintree, and Mr. H. W. Green, of Sudbury; and the oak panelling was erected by Mr. E. W. Beckwith, of Coggeshall.

NEW SCHOOLS, BELFAST.—New day schools have been erected and opened in St. Clement's parish, Belfast. The building, which is at the corner of Paxton-street, fronting Castlereagh-street, has been constructed with Laganvale selected perforated brick, with Ballycullen stone dressings. It is two stories in height, and has a floor space of 53 ft. by 36 ft. 2 in. in the clear. By means of folding partitions each floor can be divided into four classrooms, with corridor running the entire width of the building. Mr. Hutcheson Keith, Belfast, was the building contractor, who carried out the work under the direction of the architects, Messrs. C. W. Ashe & Sons, of Belfast. The gas-fittings were installed by Mr. T. Hill, while the plumbing and sanitary work was done by Mr. Job Cherry. The cost of the work has been 1,800*l*.

COUNCIL SCHOOLS, EMMAVILLE AND CROOKHILL, DURHAM.—New schools have been erected in these villages by the Durham County Council. The building at Emmaville, which has been erected by Messrs. Blackett & Sons, contractors, Darlington, from the plans of Messrs. Liddle & Browne, architects, Newcastle, consists of a mixed and infants' departments. Accommodation is provided for 550 scholars. The contractors for the school at Crookhill were Messrs. E. R. Davison, Blaydon, the architect being Mr. Bendle, of Newcastle.

WESLEYAN SUNDAY-SCHOOL, SWANAGE, BOURNEMOUTH.—The building of a new Wesleyan Sunday-school has been begun at Swanage. The new school is being erected at a cost of about 1,600*l*., and has been designed by Messrs. W. T. Chinchen & Son, of Wimborne. Mr. T. Clarke, of Swanage, is the builder.

SECONDARY SCHOOL, CHICHESTER.—The new secondary school for girls, which, on the proposition of the West Sussex Education Committee, and with the assent of the County Council, is to be erected at Chichester, will be situated in Stockbridge-road. The site extends to eight acres, and will provide for playing-fields, adjoining the school, laid out for hockey, tennis, etc.; but four of the acres are to be reserved for a boys' secondary school, to be built at some future date. There will be accommodation for 200 girls. The proposed building has been designed on the central hall plan, the hall being carried up through both floors with a balcony at the first floor level, which can be used for drill. The whole of the school could be accommodated in the hall. Round it are grouped eight classrooms, four on each floor. A laboratory for practical science to accommodate twenty-four is provided for on the ground floor, and there will be a cookery-room with a separate entrance for elementary scholars. On the first floor there will be a music-room, a studio with a north light to accommodate twenty-five, and a dining-room, with a kitchen and the necessary offices adjoining. The dining-room will have a southern aspect, and will accommodate eighty-eight at one sitting. The playground is also to be on the same side of the building, and there will be a shed for use in wet weather. The building, which will be of red bricks with stone dressings, will be heated by hot water, but in addition there will be fireplaces in the classrooms. A system of natural ventilation will be installed. Including 1,750*l*. for the site, the total cost of the school is estimated at 12,350*l*. The architect is Mr. H. P. Roberts, of Horsham.

WESLEYAN HALL AND SCHOOLS, EASTBOURNE.—A new Wesleyan hall and schools, which have been built at Eastbourne, were opened on the 14th inst. The premises, which cover a total area of 5,600 sq. ft., are faced with Kentish rag and Portland stone dressing. The large hall provides accommodation for 350 people. Electricity has been installed all through the building, while gas is laid on to meet cases of emergency. On the ground floor are seven rooms, and a concrete staircase with oak handrail and iron balustrade leads to three apartments above. A kitchen is provided in the basement. The principal entrance to the premises is in Langney-road, where there is a vestibule and entrance-hall. Mr. Carlos Crisford was the architect of the work.

THEOLOGICAL COLLEGE, LLANDAFF.—St. Michael's Theological College, Llandaff, was opened a short time ago. The college is built on a site in Llandaff where the late Mr. John Prichard, who was Diocesan Architect and architect for the restoration of the cathedral, lived, and on which he built studios, and also commenced the building of a residence for himself. This property was purchased by Mr. W. S. de Winton and presented by him to St. Michael's College on the understanding that the work begun by the late Mr. Prichard should be preserved and incorporated into the scheme for the college buildings. This led to the Prichard buildings being extended and made into an administrative block, while accommodation for the sub-warden, the chaplain, and thirty-two students has been arranged in three independent blocks, which, together with the administrative block, form a quadrangle, leaving room for a chapel on its west side. In the administrative block accommodation is provided for the warden and his visitors, a dining-hall, common-room, lecture-room, library, temporary chapel, rooms for the lady superintendent, kitchens, and extensive servants' offices. The students' blocks, arranged round three sides of the quadrangle, provide small residences for the sub-warden and chaplain, also students' rooms in sets of four off staircases, in which each student has two rooms; there is also a bathroom and a large store attic for the four men on each staircase. The college is warmed by hot-water radiators as well as open fires, and both hot and cold water is laid on for the accommodation of all who reside in any part of the college buildings. The excavations from the foundations, etc., have been made use of to level up the quadrangle, and the ground on the sorth side of the students' blocks, below which a private garden has been made for the warden. Cottages will be required for two married men servants, and the erection of a chapel is contemplated. The architect is Mr. F. R. Kempson, of Cardiff.

AGED MINERS' HOMES, NEWSHAM, BLYTH.—A further group of cottages for the Northumberland Aged Mine Workers' Homes Association, is being built at Newsham, near Blyth. The Newsham colony, when completed, will make up the first hundred cottages owned by the Association. The cost of each colony of ten dwellings averages about 1,000*l*. Mr. T. Tulip, of Choppington, as in the other cases, prepared the plans, and, in conjunction with Mr. John Wilson, of Blyth, the Secretary to the Association, will superintend the carrying out of the work.

CLUB PREMISES, BOLLINGTON.—New premises are to be erected for the Bollington Conservative Club. They will comprise a reading-room and library, an assembly-room accommodating upwards of 100 persons, a billiard-room, a card-room, and a bar. The premises will also embrace a smoking-room, committee-room, and secretary's room, in addition to the necessary lavatory accommodation. The offices of the local Conservative and Unionist Association and of the Party Agent will also be on the premises. The cost is estimated at 1,580*l*., and of the equipment, 420*l*. Messrs. Whittaker & Bradburn, of Macclesfield, architects, have prepared the plans.

WORKHOUSE INFIRMARY, SLOUGH.—The new infirmary at the Slough Workhouse has just been opened. The new building was erected by Mr. D. Bowyer at a cost, including extras, of about 6,000*l*., and Messrs. Smith & Sons, of Reading, were the architects. The furnishing was carried out by Messrs. Atkinson & Co., at a cost of about 500*l*. Accommodation is provided for over seventy patients. There are two large wards, both on the ground and first floors, the male rooms accommodating twenty-two each, and the females' apartments twelve each, besides other wards for cases which require special treatment, and store-rooms. A bath-room is provided for the inmates of each ward, as well as the sanitary annexe. The wards are lighted by electricity and heated with hot-water pipes. The men's wards are also fitted with Shorland's patent heating apparatus, but in the women's wards, which are smaller, fireplaces have been fixed. A surgery is set apart for the doctor and rooms for the nurses on duty, whilst the matron, as superintending nurse, has her quarters on the first floor. On the ground floor is a waiting-room for visitors, and also a commodious kitchen, scullery, and pantry, with separate rooms where patients who are well enough can sit and take their meals. The more able patients will be located downstairs, so as to give them an opportunity for taking fresh air exercise. Outside both the upper wards is a covered-in verandah, from each of which is a flight of iron steps as an emergency exit in the event of fire. The nurses' bedrooms are situated at the top of the infirmary.

BUILDING OF DWELLING-HOUSES IN BRISTOL.—The Bristol City Engineer, in a report just issued, states that there was a noticeable check to the building of dwelling-houses during the past year, 133 fewer houses having been erected than during the previous year, when he called attention to the fact that the number of new houses was considerably out of proportion to the increase of the population. Although the disproportion has somewhat diminished yet the 1,239 new houses built during the past year are at least 200 more than would be required to house the 4,756 persons representing the estimated increase of population. There is, however, evidence that during the present year the diminution in house building will be maintained.

POST-OFFICE, NEWPORT, MON.—The new post-office which has just been opened in this town is a five-story building, and stands on a site in the High-street. The public office and sorting-room are on the ground floor, the former being 50 ft. by 27 ft., and 15 ft. high. The floor in front of the counter is laid with marble mosaic paving with ornamental border, and the counter—which is divided off in sections for the various departments—is of polished teak and mahogany. The sorting-room is 5,200 super. ft. in area. The second floor is occupied entirely by telegraphic and telephonic business, and the instrument-room is 65 ft. by 40 ft., and the telephone switch-room 85 ft. by 35 ft. The third floor is devoted to the needs of the telegraph engineers, stores, battery-rooms, linesman's quarters, etc. The total cost, including fittings and furniture, has been 31,000*l*., and the contractor was Mr. W. E. Blake, of Portsmouth.

NEW THEATRE, WARRINGTON.—The erection of the Royal Court Theatre at Warrington has now been completed, and the building was opened on the 5th inst. The theatre has its main frontage to Rylands-street, and here are situated all the public entrances under a veranda extending the whole length of the building. The auditorium is divided on the ground floor into pit, pit-stalls, and orchestra-stalls. Over the pit is the lower circle tier, above is the gallery. There are also four private boxes. Messrs. Hughes & Stirling, Liverpool, have carried out the main contract for the building, with Mr. Holme as general foreman. Messrs. Fred Wilkins & Brother, of Liverpool, have executed the scenery, upholstering, electric lighting and plant, and also the fire-resisting curtain. Messrs. Goodall, Lamb, & Heighway, of Manchester, have had the contract for the decorations and painting; Messrs. Tanner, of Liverpool, have done the plaster work; Messrs. Greenhalgh, of Warrington, the wood block flooring; Mr. Acton, of Warrington, the gas piping and fittings. The sunburner has been supplied by Messrs. Stott, of Manchester; the heating apparatus by Messrs. Leech Brothers, of Manchester; Messrs. Hope & Sons, Birmingham, the veranda and stained glass; Messrs. Conway & Co., Manchester, the mosaic and terazzo floors; while the sanitary fittings are by Messrs. Doulton & Co., Manchester; the locks and door furniture by Messrs. Charles Smith & Sons, Birmingham; the steel-work in the galleries has been executed by the Trafford Park Steelwork Company, and the other ironwork by Messrs. Park, of Wigan. The architect for the work was Mr. F. Bennett Smith, of Manchester.

THEATRE, GREAT QUEEN-STREET, W.C.—Mr. F. W. Foster is appointed the architect for carrying out alterations and improvements of the theatre, which will be opened by Miss Lena Ashwell as the Kingsway Theatre in October. The works include an enlargement of the orchestra, a rearrangement of the vestibule, and a new stalls buffet. The theatre was built in 1882, after plans and designs by the late Mr. Verity; the house was then remodelled for Mr. W. S. Penley by Mr. John Murray and Mr. Foster, and reopened in July, 1900, as the Novelty Theatre, the alterations having been completed under Mr. Murray's superintendence.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—The hospital is being rebuilt upon a site which has frontages to Great Portland-street, Bolsover-street, and Great Portland-place, Marylebone. The new hospital, to accommodate about 210 in-patients, is planned and designed by Mr. Rowland Plumbe.

MEN'S INSTITUTE, LILLESHALL.—The Men's Institute at Lilleshall was recently opened by the Duchess of Sutherland. The building, formerly a granary, has been altered and arranged from plans by Mr. Vickers.

UNITED SERVICES CO-OPERATIVE HOTEL, SOUTH KENSINGTON.—A company has been formed for the erection of a hotel upon a plot of land situated near Brompton-road station and opposite the Oratory, of which a lease has

been obtained. The plans and designs have been prepared by Mr. H. Chatfeild Clarke. The hotel is primarily intended for members of the Legislature, naval and military officers, and civil servants, with their families, and certain privileges upon co-operative principles will be accorded to the shareholders.

INFECTIOUS DISEASES HOSPITAL, ELY, CARDIFF.—The Llandaff and Dinas Powis District Council's new Infectious Diseases Hospital at Ely, near Cardiff, was opened on the 15th inst. The building comprises three ward pavilions, and provides accommodation for thirty-two beds. The total cost was: Land, 772*l.*; buildings, 11,676*l.*; furnishing, 825*l.*; roads, grounds, etc., 790*l.*; a total of 14,064*l.* The contractors were Messrs. Knox & Wells, and the architect Mr. J. H. James.

Sanitary and Engineering News.

CLYDEBANK WATER EXTENSION.—The cutting of the first sod of Burncrooks Reservoir for the Cyldebank and District Water Trust took place on the 10th inst. The proposed reservoir will cover an area of about 92 acres, with a capacity of about 400,000,000 gallons, and is part of a scheme which includes another large reservoir nearly three miles further west and about 10 acres less in extent. The engineers of the scheme are Messrs. Warren & Stuart, the contractor being Mr. Robert M'Robbie, of Crieff.

SOUTHWARK HOUSE DRAINS.—During the year 1906 (says the Medical Officer of Health of Southwark in his annual report) the sanitary staff was particularly active in having the drains of a large number of the older houses of the borough exposed for inspection. With very few exceptions the drains constructed more than fifteen years ago were found to have the joints open, the pipes irregularly laid, and the whole leaky and defective. The exposing and the examination of the drains of a large number of Lord Llangattock's houses in Trafalgar-street, consequent upon an outbreak of enteric fever, led to his agent, Mr. Dickins, complaining to the Public Health Committee about the alleged unreasonableness of the requirements of the sanitary authorities. After correspondence a conference took place between Mr. Dickins and the Medical Officer of Health, with the result that an amicable settlement was come to on the following basis: (1) Mr. Dickins agreed when so requested to ventilate and intercept all old clay-jointed, unventilated, and non-intercepted drains and to relay the branch drains connected therewith; (2) that while the trench is open for the reconstruction of the drainage up to the back wall of the house the drain under the house, after being plugged, is to be tested by a chemical test, and if no smell escapes the drain under the house is to be considered for all practical purposes sufficiently sound, and is not to be disturbed. In cases, however, where the smell of the tester escapes, Lord Llangattock will adhere to an agreement made in 1902 with respect to carrying out of the necessary works, the Council paying half the cost and not claiming any right over the site of such repaired combined drain.

PROPOSED NEW DRAINAGE SCHEME, TILEHURST.—On August 1, at the Village Hall, Tilehurst, a public inquiry was held by Mr. H. Shelford Bidwell, M.Inst.C.E., Inspector to the Local Government Board, into the application by the Rural District Council of Bradfield for sanction to borrow 10,350*l.* for purposes of sewerage and sewage disposal for the parish of Tilehurst. Mr. R. E. Rawstorne (Clerk to the District Council), who opened the case for the Bradfield District Council, said the area of the parish was 3,164 acres and the present estimated population 3,200. The estimated population of that part proposed to be sewered was about 3,000. The question of the need for the provision of works of sewerage for the parish first engaged the attention of the District Council in December, 1905, when complaints were received of the insanitary state of Tilehurst. A Committee of the Council called in Mr. H. Howard Humphreys, A.M.I.C.E., of Westminster, who prepared a preliminary report. The gist of this was to the effect that the engineer was of opinion that in the developed and rapidly developing portions of the parish drainage facilities should be afforded at an early date. Acting on the advice of the Engineer, the District Council approached the Corporation of Reading with the view of ascertaining whether terms could be agreed upon for the connexion of any sewers to be provided for Tilehurst with the sewers of the Corporation, whereby it was hoped that a considerable saving in the cost of outfall works might be made. These negotiations were, however, unsuccessful, and the District Council, in March, 1906, instructed their Engineer to prepare a definite scheme of sewerage and of sewage disposal for the parish, together with an estimate of the probable cost. The scheme of the Engineer was adopted by the Rural District Council, and the following are the particulars of the estimated cost: Actual construction of works 7,743*l.*, land 1,100*l.*, resident engineer's salary 120*l.*, easements 250*l.*, contingencies, etc. (5 per cent.), 440*l.*, fees, etc., 528*l.*; total 10,181*l.* The Council agreed afterwards to modify the proposed scheme, which would represent an estimated saving in the total cost of the works of 393*l.* In the course of the inquiry Mr. H. Howard Humphreys, the Engineer, gave details of the proposed scheme.

Foreign.

FRANCE.—The works have been commenced for the rebuilding of the Pont Notre Dame, Paris, which dates from 1853, and was built to replace the wooden bridge constructed in 1492, in place of a still earlier one which had fallen in. ——The Académie des Beaux-Arts have awarded the Troyon prize to M. Louis Cartier-Bresson, landscape-painter.——M. Masson, architect, has been commissioned to carry out a new Boys' School at Bobigny, to cost 172,000 francs.——The Empress Eugénie has offered to the Musée des Arts Décoratifs a very interesting collection of water colours executed by different artists for the decoration of the private apartments at the Tuileries.——The jury in the first competition for a new theatre to be built at Lille have selected the following architects to be invited to take part in the second competition: MM. Cordonnier, Dehaudt, Dalemer, Imandt, and Hainez, all of Lisle.——A monument has been erected at Rochefort to the eminent chemist Grimaux, who was a zealous collaborator of Pasteur.——The Municipal Council of Tours have voted a sum of 300,000 francs for the restoration of the Lycée Descartes.——A monument has been erected at Bayonne to the memory of the French and English soldiers who fell in 1814 before that city. The sculptural portion of the monument is the work of M. J. Froment Meurice; the decorative and architectural portions were carried out by M. Clement-Mère and M. Waldreff.——The jury in the competition opened at Toulouse for a suburban hospital have awarded the first premium to M. Barthélemy Guitard, of Toulouse.——The Art-Museum at Montpellier has received an important addition of pictures by Daubigny, Diaz, Millet, Jongkind, and Dupré.——The Sixth International Fine-Art Exhibition at Cannes is to be held from January 31 to March 10, 1908.——The death is announced, at the age of ninety-one, of M. Jules Bouchot, Honorary Architect of Bâtiments Civils, and Officier of the Legion of Honour. He was the brother of Felix Bouchot, the former Curator of engravings in the Bibliothèque Nationale.

GERMANY.—The province of West Prussia has again suffered loss from storm. Two years ago the incomplete tower of St. Catherine's Church, Dantzig, was destroyed; now the mediæval parish church of Stublau has lost its steeple, which was a landmark for the surrounding country. On a square substructure of masonry 12 metres in height stood the octagonal wooden steeple 24 metres high. This structure had been renewed in the XVIIth century, but some of the timbers having rotted the ties had worked loose, with the result that the wind lifted it bodily and overthrew it. Herr Kleefeld, Inspector of Buildings in Dantzig, has already taken steps to have it rebuilt. The new police buildings, just opened in Cologne, were built at a cost of 1,130,000 marks, from designs prepared in the Public Works Department, under the direction of Herr Launer.——Peller's Odyssey frescoes in the Roman House, Leipzig, were in danger owing to the prospective demolition of the building. Herr Donadini, Professor in the Art School, has successfully removed them and set them up on the staircase walls of the University library built by the late Rossbach.——The Church of St. Boniface, Berlin, designed by Herr Hasak, was consecrated in June. The twin-tower church built of brick forms a noble group with the many storied ecclesiastical building attached to it.——The new County Courts just opened in Stade are built from designs prepared in the Public Works Department under the direction of Herr Thoemet. They are built of rough-cast with sandstone dressings on a granite plinth, and roofed with Italian tiles and copper domes.——In the competition for a Protestant church to be built in Krimmitschau, the first prize of 2,000 marks was awarded to Walter Wiesinger, of Leipzig.

AUSTRIA.—The sixth congress of the German Heating and Ventilating Engineers met last June in Vienna, the number of members attending being over 500. From the scientific as well as from the social point of view the congress was a success. Herr Suwald of Brünn regretted that in Austria large heating and ventilating stations are considered necessary evils, and that there is no facility for obtaining instruction in these sciences so that experts on these subjects are usually laboriously self-taught.——The Architectural Association of Vienna has decided to place a memorial-tablet on the house where died the celebrated architect, Johann Bernhardt Fischer v. Erlach. The tablet will be unveiled next year on the occasion of the International Architectural Congress.

SWITZERLAND.—The administrators of the Swiss railways have approved of the proposal of the general manager to build a second Simplon Tunnel, and charged the management to hand over to the Federal Council securities to the amount of 34.6 million francs. The building of the tunnel will take seven years.——The Municipality of Lausanne has sanctioned a loan of 90,000 francs for building a mortuary chapel and crematorium. The Swiss Cremation Society contributes 19,000 francs towards the expenses.

HOLLAND.—The new harbour works in Rotterdam will shortly be put in hand, and will result in forming the largest dock in the world, measuring 310 hectares (766 acres). The traffic at Rotterdam is increasing at such a prodigious rate, the net tonnage of the sea vessels in 1906 reaching 9,125,860 as against 4,177,478 ten years previously, that it is considered advisable to allow in the new dock for a possible redoubling of the traffic. On either side of a fairway 200 mètres wide berths will be provided for 140 large vessels. The work will be carried out in three sections, as increased accommodation is required; the first section of 40 hectares will cost 4,800,000 kronen.

SOUTH AFRICA.—Regarding the recent competition for the designing of a new Town Hall and Municipal Offices for Buluwayo, there were nine drawings sent in; three were provisionally selected by the building committee, namely, Messrs. McGillivray & Gant and Mr. N. J. Cowin both of Cape Town, and Mr. Cope Christie of Rhodesia.——The Town Engineer of Pretoria has been authorised by the Municipal Council to proceed with the channelling and macadamising of St. Andries-street, at an estimated cost of 6,300*l.*, the material to be used being Fountain Road stone and diabese kerbing. ——During the month of June seventeen plans for new buildings were passed by the Pretoria Council; the estimated cost was 9,237*l.*——The foundation-stone of St. Luke's English Church, Orchards, was laid on July 24 by the Right Rev. Bishop Carter of Pretoria. The stone to be used throughout the building is being supplied from a local quarry. Messrs. Baker & Massey are the architects, and Messrs. Haynes & Adams are the builders. The building will cost 1,200*l.*; this figure includes 200*l.* for fixtures.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Messrs. Ellkay & Co., Ltd., contractors for housing specialties, have removed from 59, Holborn-viaduct to 12 and 13, Upper Thames-street.

INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.—His Highness Prince Henry zu Schönaich-Carolath has consented to act as President of the fourteenth International Congress for Hygiene and Demography; Dr. Rubner, Privy Councillor of Medicine, Professor of Hygiene at the Royal University of Berlin, and Professor Dr. von Mayr, Under-Secretary of State, Munich, will be Vice-Presidents.

THE PROPOSED NEW INFIRMARY, EDMONTON.—The Edmonton Board of Guardians recently decided to erect an infirmary adjoining the workhouse in Bridport-road, at a cost of 160,000*l.*, because the existing building was inadequate for the purposes of a workhouse proper and for the treatment of the sick poor as well. The Local Government Board gave their sanction, and plans were invited for a suitable erection. Five of these plans were submitted to an assessor, and he decided upon one. The designs were sent to the Local Government Board about a month ago, and a deputation of the Buildings Committee of the Guardians waited upon the leading officials connected with new buildings of the character it was proposed to erect. Certain modifications were then suggested, and as a result the plans were returned, and came up before the meeting of the Guardians held on Wednesday last week. It seems, according to an official of the Board, the modifications were important, and a sum of 70,000*l.* was mentioned as being possibly wiped off the original sum for the cost of building if the suggestions of the Local Government Board were adopted.—*The Tribune.*

COMPENSATION AWARDS, LONDON.—An award of 1,750*l.* has been made in the case of Toler Brothers, Ltd., *v.* the London County Council in respect of a claim made to the leasehold interest in some premises at the south end of Savoy-street, Victoria-embankment, which are required for purposes of the tramway tunnel. The award carries with it a right of repossession of the greater portion of the premises, together with extra accommodation. The case was heard by the High Bailiff of Westminster and a special jury. Mr. Andrew Young (valuer to the Council), Mr. L. R. Vigers, Mr. P. H. Clarke, and Mr. B. J. Breach were valuers for the Council, those for the claimants, a firm of stationers and newsagents, being Mr. W. H. Elwell and Mr. J. H. Townsend Green; the Council were represented by Mr.

Lewis Coward, K.C., and Mr. Morten, and the claimants by Sir Edward Boyle, K.C., and Mr. Courthope-Munroe. For the leasehold interest for a term of twenty-four years unexpired of No. 169, High Holborn, required by the Postmaster-General, a sum of 3,500*l.* was awarded in the Sheriffs' Court, Red Lion-square, a few days ago. The Attorney-General and Sir Edward Boyle, K.C., appeared for the Crown and the claimants respectively; Mr. L. R. Vigers, Mr. A. R. Stenning, and Mr. J. W. Penfold were experts for the Post-Office, and Mr. J. H. T. Green, Mr. A. Furber, and Mr. Coade for the claimants.

HISTORICAL HOUSES, BATH.—Tablets have been affixed upon the house in Green Park, at one time inhabited by De Quincey; and the house occupied by Selina, Countess of Huntingdon, which adjoins the chapel she built in 1765.

BAYARD MEMORIAL, U.S.A.—A bronze statue has been erected in Wilmington, Delaware, in memory of the late Thomas Francis Bayard, who was the first ambassador from the United States to our country and Secretary of State in President Cleveland's first cabinet. Two tablets on the rock pedestal are inscribed with brief records of his public services. The memorial and statue were modelled by Mrs. William Ritchie (Miss Effie Stillman), of London.

DUST PREVENTION TESTS.—The Judges Committee appointed by the Roads Improvement Association (Incorporated) to carry out the competitions for the best tar-spreading machine and the best preparation of tar for road purposes have made their awards as follows:—Competition for the best tar-spreading machine—1st prize of 100 guineas and the Association's gold medal to Thomas Aitken, County Buildings, Cupar Fife, for "Aitken's Patent Pneumatic Tar Sprayer"; 2nd prize of 50 guineas and the Association's silver medal to Tarspra, Ltd., 20, Victoria Street, London, S.W., for their "700 gallon 'Tarspra' (Patent) Thornycroft Motor Van." Competition for the best preparation of tar for road purposes—1st prize of the Ballymenagh Woollen Factory Company's 100 guineas trophy and the Association's gold medal to R. S. Clare & Co., Ltd., Stanhope-street, Liverpool, for "Clare's Patent Tar Compo." These tests were carried out on May 22, 23, 24 and 27 last on certain roads in Middlesex and Berkshire. Since these dates the roads have been kept under constant observation, and, durability being an important consideration, it has not been possible to make the awards until the present time. The cost of these trials was borne by the Royal Automobile Club and the Motor Union of Great Britain and Ireland. The Judges Committee, in addition to the members of the Council of the Roads Improvement Association and others, included eight engineers and road surveyors, appointed after consultation with the Incorporated Society of Municipal and County Engineers and the County Surveyors' Society.

THE "AULD BRIG" AT AYR.—In his second report to the Executive Commitee on the progress of the work of preservation of Ayr Auld Brig, Mr. W. S. Wilson, C.E., Glasgow, the engineer, states that the pointing of the two arches and two piers, as well as two-thirds of the third arch, is done. The roadway for a length of 200 ft. has been removed, and arches Nos. 1, 2, and 3 have been strengthened in the manner described in his last report. The central spandril walls have been built on three arches. The external spandril walls of arches Nos. 1 and 2 were found to be of substantial thickness, but in arch No. 3 they are too thin, and he proposes to strengthen them by adding a foot to their thickness on the inside. A good deal of grouting has been done. The pits in piers Nos. 1 and 2 are being sunk—the first being down 26 ft. from the road level. There are twenty-one men employed on the bridge, and the expenditure to date, including wages, plant, and material, has been 437*l.*

PROPOSED PAVING WORKS, SHEFFIELD.—On the 13th inst. Mr. W. A. Ducat, Local Government Board Inspector, held an inquiry at the Town Hall, Sheffield, into three applications by the Corporation for borrowing powers. The largest of the applications was for power to borrow 26,548*l.* for works of paving. A number of streets which are at present paved with boulders, old gritstone sets, or other unsatisfactory materials, are to be put in better repair. Most of the streets will be paved with granite cubes and sets, and some with gritstone sets. The Corporation also seek to borrow 9,146*l.* for the purposes of the Olive Grove highway depôt. The principal items are:—Two foremen's houses and stores, 1,038*l.*; paving yard and approaches, 2,617*l.*; railway sidings, points, and crossings, 1,111*l.*; boundary wall, 1,361*l.* The third application related to Crofts area No. 1, in connexion with which 2,770*l.* is required. Power to borrow 28,000*l.* for the erection of houses on that area was obtained in 1900. The work was actually done for 2,227*l.* less than that sum, but additional works—sewers, streets, etc.—were carried out at a cost of about 5,000*l.*, and the Corporation wish to borrow the difference. Mr. W. J. Hadfield, the Deputy City Surveyor, was present at the inquiry.

Capital and Labour.

WINTER WORKING HOURS OF SHEFFIELD BRICKLAYERS.—A meeting of the Sheffield Conciliation Board was recently held at the Building Trades Exchange, Sheffield, to consider a recommendation from the operative bricklayers that short time for the winter months should commence on October 24 instead of November 1, and cease on February 6 instead of February 13. Mr. A. J. Forsdike presided, and Mr. G. W. Broadley (of the Manchester Order of Operative Bricklayers) was elected to the vice-chair and presided over the operatives' section. It was pointed out by the operative bricklayers that the suggested alteration was to the benefit of employers no less than the employés. Under the existing conditions workmen were engaged for half an hour per day for a week before November 1 when there was hardly sufficient light to work, and working under such conditions was conducive to accidents, which both sides were most anxious to prevent. On the other hand, they were working on short time in February for a week in which they could far better work full time than the last week in October. The representatives of the other trades present said that they had not had an opportunity of placing the matter before their respective societies, but they did not anticipate any objection to the alteration, which they thought would be to mutual advantage. On behalf of the employers, Mr. Forsdike said that they fully realised the reasonableness and justice of the suggested alteration, with which they were in perfect agreement, and would submit the alteration to the meeting of the Master Builders' Association, and after it had received the sanction of the various operative societies it would, he suggested, be formally confirmed by a printed slip being inserted in the various rule books.—*Sheffield Independent.*

STATE OF THE BUILDING TRADES.—Employment in July continued dull. It showed little general change compared with a month ago and a year ago. Returns from 700 firms employing 45,634 workpeople at the end of July showed a decrease in the number employed of 0·4 per cent. as compared with a month ago. Employment was especially dull with plumbers. It continued fair with painters and slaters. Compared with a month ago employment with bricklayers showed an improvement and with plumbers a decline. Compared with a year ago slaters reported an improvement. The percentage of trade union carpenters and joiners unemployed at the end of July was 5·0, as compared with 4·9 a month ago and 5·3 a year ago. The percentages of trade union plumbers unemployed for the same periods were 8·8, 8·3, and 8·9 respectively.—*Labour Gazette.*

Legal.

SHEFFIELD RIGHT OF WAY CASE.

IN the Vacation Court, before Mr. Justice Pickford, on the 21st inst., Mr. Bramwell Davis, K.C., mentioned the case of the Attorney-General *v.* The Hippodrome (Sheffield), Ltd.

The learned Counsel stated that the matter referred to an alleged public right of way at Sheffield. Mr. Ashton Cross appeared for the respondents on the motion, and he wanted it to stand over until next motion day so as to give him an opportunity of answering plaintiff's evidence. For this indulgence the respondents were prepared to give an undertaking to remove the hoarding put upon the public right of way and not to obstruct a certain door opening into the passage and to keep matters in *statu quo* until next motion day.

His lordship assented to the application.

RESTRICTIVE COVENANTS OF BUILDING ESTATE.

THE case of Nussey *v.* The Provincial Bill-posting Co., Ltd., came before Mr. Justice Pickford in the Vacation Court on the 21st inst., on a motion by the plaintiff for an injunction restraining the defendants until the trial or further order from erecting or keeping erected in the Cardigan-road, at Headingley, near Leeds, a hoarding for advertisements in alleged breach of a covenant contained in an indenture dated October 6, 1877.

Mr. Bramwell Davis, K.C., in support of the application, said that the plaintiff was the owner of a house which formed part of the Headingley Gardens Estate. It was intended to lay out the estate for building subject to certain conditions applicable to the whole of the estate and various persons bought plots subject to those conditions, including the plaintiff. The learned Counsel went on to state that the purchaser of plots on the estate entered into a covenant that they would erect a dwarf wall with iron rails on the top by the side of the Cardigan-road, and that they would not carry on any noisy or offensive trade or business on the premises. The defendants were not the owners of the property in question, but they had entered into an agreement with a Mr. Edison, the owner of one of the plots, which permitted defendants to put up the hoarding and maintain it for the term of seven years. He (Counsel) submitted that this constituted a breach of the covenant in question, and that the defendants should be restrained in the manner asked by the notice of motion. He said that the defendants had already erected the hoarding, and he accordingly asked for a mandatory order compelling them to remove it pending the trial. If it were held at the trial that the plaintiff was wrong, of course he would be held liable in damages to the defendants.

Counsel for the defendants submitted that there had been no breach of the covenant by the defendants, and that the application should be refused. The hoarding was never intended he said, as a fence, and space had been left in front of it for the proper fence wall to be erected in accordance with the covenant.

In the result, his lordship declined to grant an *interim* injunction as asked, and dismissed the application.

Patents of the Week.

APPLICATIONS PUBLISHED.*

16,495 of 1906.—J. J. NAYLOR: *Fire Grates.*

This relates to a multiple grate revolvable in a horizontal plane and situated in the partition wall between the fireplace openings of two or more adjoining apartments, and arranged in such a manner that one grate may in succession be used in all the apartments or all or some of the units of the multiple grate may be in use simultaneously.

16,502 of 1906.—T. VAN KANNEL: *Metallic Frames for Revolving Doors.*

This relates to a revolving door of the kind which are often used in a segmental casing to afford ingress and egress for buildings without permitting the access of dust and draughts of air, and comprises metallic arms which in the case of rigid wings are attached rigidly to the centre spindle and project in opposite directions therefrom, the wing frame being supported on the arms which are of such rigid character as to hold the wing frames firmly, and prevent them positively from bending the joints of the rails, the outer corners of the wing being strengthened by tubular angle pieces and the joints of the intermediate rails by tubular ties secured within the ends of the rails and within the breadth of the stile.

16,983 of 1906.—J. J. RATHBONE: *Chimney Cowls.*

This consists in the combination with a cone having an open top for the admission of wind pressure inside the said cone of a circular plate fixed inside said cone for the purpose of directing the wind away from the flue pipe and out at the bottom edge of the cone.

17,006 of 1906.—P. TIMOFEEFF: *Manufacture of Cement for Building and like purposes.*

This relates to the manufacture of cement for building and like purposes, and consists in mixing finely ground calcined sulphate of lime with siliceous mortar and dextrin or casein.

17,082 of 1906.—J. E. YORK: *Process of making Steel Shapes for Columns and the like.*

This relates to the process of forming rolled steel shapes characterised in that an elongated piece produced by longitudinal rolling and having a rib is rolled transversely between a bed and roller whereby its projecting portion is spread laterally to both sides to form a thin wide plate, which plate is then bent into a channel shape with said ribs at its middle and with its edges turned outwardly to form flanges.

19,949 of 1906.—W. H. BROWN: *Bond Ties for Walls and the like.*

This relates to a reinforcing bond for buildings and comprises the use of a series of wire netting strips (containing longitudinal tensional strands) inserted either vertically or horizontally within or passing up and down, over, under, through, or between the courses or units of brick, stone, concrete, or other building material.

22,069 of 1906.—F. H. GILBODY: *Automatic Coin-freed Door-locking Mechanism.*

This relates to coin-freed door-locking mechanism in which the coin acts upon the bolt releasing parts sideways under the force of the outside operated part, which acts upon the face of the coin and in the edge.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

PATENTS.—*Continued on page 233.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xix.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competitions.

SEPTEMBER 18.—**Mullingar.**—DRAINAGE.—Mullingar R.D.C. invite the submission of plans, estimates, and specifications for a main drainage system for the town of Mullingar, and are prepared to award a premium of 50*l.* for the best and most suitable sent in. Copy of the conditions of the competition and instructions to competitors can be obtained on application by letter to Mr. Laurence Gavin, Clerk of Mullingar R.D.C.

DECEMBER 15.—**Stockholm.**—BRIDGE.—The Commercial Intelligence Branch of the Board of Trade have received from His Majesty's Consul at Stockholm a copy of the "program" issued with reference to a new bridge in Stockholm, for which designs and plans are invited. Prizes of 7,000kr., 4,000kr., and 300kr. are offered. The bridge is estimated to cost over 20,000*l.* Sketches, drawings, photographs, etc., to assist an architect in forming an idea of the place may be obtained from "Stockholms Stads-byggnadskontor" by paying 25kr. Designs, in sealed envelopes, bearing a motto and marked "Taflingsforslag till bro ofver Norrstrom," must be delivered to "Dratselmanndens registrator, kansli, No. 2, Stora Nygatan, Stockholm, Sweden," not later than 3 p.m. on December 15, 1907. The "program" may be seen at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, London, E.C.

* NO DATE.—**Southport.**—NEW SCHOOLS.—The Corporation of Southport invite architects practising in Lancashire to submit designs for new public elementary schools, to cost about 13,500*l.* Premiums of 50*l.*, 30*l.*, and 15*l.* will be paid. For further particulars refer to an advertisement in this issue.

Contracts.

BUILDING.

AUGUST 26.—**Huddersfield.**—SHOP FRONTS.—New shop fronts to Nos. 1 and 3, Buxton-road, Huddersfield. Plans may be seen, and bills of quantities obtained, at office of Mr. J. Berry, architect and surveyor, 3, Market-place, Huddersfield.

AUGUST 26.—**Newtongrange.**—COTTAGE.—Edinburgh and District Water Trustees invite tenders for the excavator, mason and brick, carpenter and joiner, plumber, slater, and plaster cement works in connexion with the cottage proposed to be erected at Newtongrange. Schedules of quantities may be had on application to Mr Edward C. Carse, architect, 37, Frederick-street, Edinburgh, at whose office plans of the proposed cottage may be seen.

AUGUST 26.—**Shipley.**—WAREHOUSE.—A warehouse at Shipley for "Woolcombers, Ltd." Quantities to be obtained, and plans and specifications seen, at offices of Messrs. James Young & Co., architects, 62, Market-street, Bradford.

AUGUST 26.—**Slaithwaite.**—SHEDS.—The excavators, masons, carpenters and joiners, plumbers and glaziers, slaters, patent glaziers, steel and iron founders, concretors, and painters' works required in the erection of sheds at Slaithwaite. Plans may be seen, and quantities obtained, at Milnsbridge Office of Messrs. Lunn & Kaye, architects and surveyors, Milnsbridge and Huddersfield.

AUGUST 26.—**Snainton.**—HOUSE, ETC.—For pulling down existing buildings and building house and shop, with bakehouse, etc., at Snainton, for the executors of the late Mr. James Kirk. Plans and specifications may be seen at 166, Prospect-road, Scarborough. Mr. David Petch, architect, Scarborough.

AUGUST 27.—**Belfast.**—STORE ROOM.—Belfast Board of Guardians invite proposals for making a store room, erecting a circular stair, heating clothing stores, and carrying out alterations at the Clerk's office, Workhouse, in accordance with the plan and specification prepared by Messrs. Young & Mackenzie, architects and engineers, Belfast. The plan can be seen at office of Mr. Joseph W. Robb, Clerk of the Union, Clerk's office, Union Workhouse.

AUGUST 27.—**Castlerea.**—HALL.—For building a memorial hall and schools at Castlerea, Co. Roscommon. The plans and specification can be seen at office of Messrs. William H. Byrne & Son, architects, 20, Suffolk-street, Dublin. Quantities have been prepared by Mr. D. W. Morris, surveyor, 68, Harcourt-street, Dublin, and can be obtained on application.

AUGUST 27.—**Chesterfield.**—ALTERATION TO PREMISES IN THEATRE YARD.—Chesterfield Corporation invite tenders for executing alterations to the premises in Theatre Yard, occupied by Mr. J. H. Green. Plans, specifications, and all particulars may be seen at office of Mr. S. B. D. Shewbrooks, architect, Market-place, Chesterfield, where bill of quantities may be obtained on payment of 2*l.* 2s.

AUGUST 27.—**Cwmavon.**—ALTERATIONS, ETC., TO CHAPEL.—Alterations and additions to Penuel Baptist Chapel, Cwmavon, for the Rev. R. S. Morris and the Trustees. Plans and specifications may be seen with Mr. Thomas Davis, Tymaen, Cwmavon, and at office of Messrs. Evans & Jones, architects and surveyors, Trinity-place, Swansea, and quantities may be obtained from architects on deposit of 2*l.* 2s.

AUGUST 27.—**Golcar.**—CLUB.—The excavators', masons' and bricklayers', carpenters' and joiners', plumbers', slaters', plasterers', painters', concreters', and heating engineers' works required in the erection of new club at Leymoor, Golcar, for the Thorp Green Working Men's Club and Institute. Plans may be seen, and quantities obtained, at office of Mr. Arthur Shaw, architect, Golcar.

AUGUST 28.—**Banff.**—VILLA.—The mason, carpenter, plumber, slater, plaster, and painter works of a villa, to be erected at Banff. The plans and specifications may be seen with Mr. G. A. Cumming, solicitor, Banff, and at the office of Mr. John Wittet, architect, Elgin.

AUGUST 28.—**Hengoed.**—SCHOOL ENLARGEMENT.—The Glamorgan C.C. invite tenders for the enlargement of the County School for Girls at Hengoed. Plans and specification may be seen, and copies of the bill of quantities obtained, at the Pontypridd Police-station and at offices of Mr. T. Mansel Franklen, Clerk of the Glamorgan C.C. Glamorgan County Offices, Westgate-street, Cardiff.

AUGUST 28.—**Rochdale.**—WALL.—Rochdale General Purposes Committee invite tenders for the erection of a retaining wall at Sparth, Manchester-road, Rochdale. Plans may be seen, and copies of the form of tender, bill of quantities, and further particulars obtained, at the office of Mr. S. S. Platt, Borough Surveyor, Town Hall.

* AUGUST 28.—**Windsor.**—BARRACKS.—Tenders are invited for works in foundations of proposed new barracks block, including demolition of existing buildings and clearing site at Victoria Infirmary Barracks, Windsor. For further particulars see advertisement in this issue.

AUGUST 29. **Wilton.**—CHURCH RESTORATION.—The restoration of Wilton Church, near Redcar. Plans and specification on application at the Vicarage. Quantities may be obtained on application to Mr. G. R. Boreham, quantity surveyor, 24, John-street, Sunderland.

AUGUST 30.—**Powburn.**—HOUSE.—Tenders (single or whole) are required for a new dwelling-house at Powburn, for Mr. R. D. Short. Plans and specification may be seen at office of Mr. M. Temple Wilson, M.R.San.I., architect and surveyor, Alnwick, and copies thereof at the Plough Inn, Powburn.

* AUGUST 30.—**Yiewsley.**—PARISH ROOMS.—Tenders are invited for the erection of proposed parish rooms, in connexion with St. Matthew's Church, Yiewsley. For further particulars see advertisement in this issue.

AUGUST 31.—**Dorney, Slough.**—STABLING.—Slough U.D.C. invite tenders for the supply of materials and labour for the erection of stabling at the Manor Farm, Dorney. Plans may be seen, and specification and form of tender obtained, upon deposit of 2*l.* at the Town Surveyor's office, 1, Mackenzie-street, Slough.

AUGUST 31.—**Downpatrick.**—COTTAGES.—Downpatrick R.D.C. invite tenders for building and fencing seventy-four single labourers' cottages, and for building and fencing nineteen double labourers' cottages. Plans and specifications and tender forms for the works can be obtained from the Clerk to the R.D.C. on payment of 5s.

AUGUST 31.—**Hull.**—WALL, ETC.—Messrs. G. D. Webster & Son, Ltd., invite tenders for building of brick wall at the back of St. Andrews Dock branch premises, also corrugated iron roofing, with skylight. Particulars and leave to view from the "Manager," St. Andrews Dock.

AUGUST 31.—**Llwynypia.**—CHAPEL, ETC.—The Trustees of Caersalem Welsh Baptist Church, Llwynypia, invite tenders for the erection of a new chapel, vestry, and class-rooms. Plans and specifications to be seen at office of Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

AUGUST 31.—**Maesteg.**—OFFICES.—Tenders are invited by North's Navigation Collieries (1889), Ltd., for the erection of new offices at Maesteg. Plans can be seen at, and specification and bills of quantities obtained from, Mining Offices, Maesteg, on payment of 1*l.* 1s.

AUGUST 31.—**Walton-le-Dale.**—FIRE-STATION, ETC.—Walton-le-Dale U.D.C. invite tenders for (1) the erection of a fire-station and other buildings, (2) paving, flagging, and other works in Fairfield and Birtwistle streets, Lostock Hall. Plans and sections may be seen, and a copy of the specification and bill of quantities obtained, at the office of Mr. F. E. Dixon, C.E., 49, Lune-street, Preston, on payment of the sum of 1*l.*

SEPTEMBER 3.—**Macclesfield.**—LABORATORY.—Macclesfield Corporation invite tenders for the various works required in the erection and completion of a proposed laboratory at the Macclesfield Sewage Works, Butley. Plans, elevations, sections, and specifications may be seen at the office of the Borough Surveyor, Town Hall, Macclesfield.

SEPTEMBER 3.—**Quaker's Yard.**—HOUSES.—The erection of twelve or more houses at Quakers' Yard for Messrs. the Goitre Coed Building Club. Plans and specification can be seen at the office of Mr. William Dowdeswell, architect, Treharris.

SEPTEMBER 4.—**Trenavin.**—CHAPEL.—For erecting a Wesleyan Chapel at Trenavin, near Callington. Plans and specifications can be seen either at the office of Mr. John Sansom, architect, Liskeard, or at the house of the Rev. W. J. Pearce, Callington.

* SEPTEMBER 5.—**Alton.**—PETTY SESSIONAL COURT.—The Southampton C.C. invite tenders for a Petty Sessional Court at Alton. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 6.—**Southampton.**—BRIDGE.—The Hants C.C. invite tenders for the reconstruction of the superstructure of St. Cross Bridge, No. 852. For further particulars see advertisement in this issue.

SEPTEMBER 6.—**Treherbert.**—COTTAGES.—The Ynysfaio No. 1 Building Club, Treherbert, invite tenders for the erection of ninety-one cottages, more or less, at the option of the club. Plans and specifications to be seen at the offices of Mr. J. Rees, architect, Pentre.

SEPTEMBER 7-23.—**Amble.**—SCHOOL.—Northumberland Education Committee invites tenders for the work of erecting a new Council school to accommodate 220 scholars at Amble. Name and address to Mr. C. Williams, Secretary to the Education Committee, Pearl-buildings, Newcastle-on-Tyne, together with a deposit of 2*l.* 2s. Plans of the work may be inspected at the Committee's Office.

* SEPTEMBER 9.—**Bromley (Kent).**—SCHOOL ENLARGEMENT.—The Kent Education Committee invite tenders for the erection of an enlargement to the Farnborough Council School, near Bromley, Kent. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 9.—**Coventry.**—GASWORKS.—The Gas Committee of the Coventry Corporation invite tenders for the erection of buildings at the Foleshill works. For further particulars see advertisement in this issue.

SEPTEMBER 9.—**North Shields.**—POLICE-STATION.—Tynemouth Corporation invite tenders for the erection and completion of the proposed West End Police-station, Lawson-street, North Shields. Plans, etc., may be seen at the office of Mr. John F. Smillie, Borough Surveyor, Tynemouth, where copies of the bills of quantities and general conditions may be obtained on payment of 2*l.* 2s.

* SEPTEMBER 10.—**Birmingham.**—TELEGRAPH STORES.—The Commissioners of H.M. Works and Public Buildings invite tenders for new telegraph stores at Birmingham. For further particulars refer to an advertisement in this issue.

SEPTEMBER 12.—**Ludlow.**—ADDITIONS TO WORKHOUSE.—Ludlow Guardians invite tenders for the erection of receiving ward, nurses' rooms, laundry, heating chamber, hot-water apparatus, etc., at the above Union Workhouse. Specifications, plans, general conditions, and form of tender may be obtained from the architect, Mr. John Butters, Railway Station, Ludlow, upon application to him, and on payment of 2*l.*

* SEPTEMBER 14.—**Lee-on-the-Solent.**—SCHOOL.—The Southampton C.C. invite tenders for new Council school at Lee-on-the-Solent. For further particulars refer to an advertisement in this issue.

SEPTEMBER 14-27.—**Yardley.**—SCHOOL.—Worcestershire Education Committee invite tenders for the erection of schools at Acock's Green, Yardley. Applications for forms of tender and bills of quantities may be made at the offices of the surveyor, Mr. George Kenwrick, F.S.I., 83, Colmore-row, Birmingham. Before obtaining the bills of quantities it will be necessary to deposit a sum of 3*l.* 3s. The drawings may be seen on and after the same date at the offices of the architect, Mr. A. B. Rowe, Worcester Chambers, Pierpoint-street, Worcester.

* SEPTEMBER 16.—**Chester.**—SCHOOL.—The City and County Borough of Chester invite tenders for new public elementary school for 600 boys and girls to be erected in Love-street, Chester. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 16.—**Chislehurst.**—SCHOOL.—The Kent Education Committee invite tenders for erection of a new Council School, Chislehurst, Kent. For further particulars refer to an advertisement in this issue.

* NO DATE.—**Bexhill.**—TOWN HALL.—The Bexhill Corporation invite tenders for certain extensions to the Town Hall. For further particulars see advertisement in this issue.

* NO DATE.—**Birmingham.**—SCHOOL.—Tenders are invited for the erection of St. Paul's High School for Catholic Girls, Vernon-road, Edgbaston, Birmingham. For further particulars refer to an advertisement in this issue.

No DATE.—**Blaina.**—COTTAGES.—The erection of thirty-two cottages at Blaina, Mon., for the Blaina Cottage Building Company, Ltd. Plans and specification may be seen, and quantities obtained (on payment of a deposit of 2*l.* 2s.), at the offices of Mr. E. A. Johnson, F.R.I.B.A., architect, Abergavenny.

No DATE. — **Darlington.** — ALTERATIONS. — Messrs. Warwick & Co., Ltd., intend to make alterations to the "Cleveland Arms," Cleveland and York streets, Darlington, and bills of quantities of the work, etc., will be sent to builders who will send in their names and addresses to Mr. W. T. Aggutter, architect, 7, Horse-market, Darlington.

No DATE.—**Gainsborough.**—HOUSE.—The erection of a dwelling-house at Stow Park for Mr. Talbot Thornton. For particulars apply, Mr. William Eyre, architect and surveyor, Gainsborough.

No DATE. — **Hatfield Peverel, Essex.** — HOUSE AND SHOP.—The erection of dwelling-house and butcher's shop. Names, etc., to Messrs. Stafford & Rogers, Ltd., surveyors, Bedford.

No DATE.—**Stamford.**—WORKSHOPS.—The erection of north light galvanised iron workshops, excavating and forming site and floors for same, erection of office, stable, and cottage near to Ryhall-road, Stamford, for the Martin's Cultivator Company, Stamford. Particulars can be obtained from Mr. J. T. Ward, architect, Stamford.

ENGINEERING, IRON, AND STEEL.

AUGUST 27.—**Hull.**—GATES AND ROADWAY.—Kingston-upon-Hull Guardians invite tenders for making new gates and roadway from Argyle-street into the grounds of the Workhouse. Plans and specification can be seen on application to the Master, at the Workhouse, Anlaby-road.

AUGUST 27.—**London.**—WHEELS AND AXLES.—Bombay, Baroda, and Central India Railway Company Directors are prepared to receive tenders for the supply of:—(1) Wheels and axles; (2) pig iron. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices of Mr. W. V. Constable, Secretary, Gloucester House, 2, 3, and 4, Bishopsgate-street Without, E.C., on payment of 21s. each (which will not be returned).

AUGUST 28.—**Darlington.**—ROOFS.—Darlington Corporation invite tenders for erecting roofs over three-fold yards at the Sewage Farm, and for relaying a wood floor at the Corn Exchange. Plans and specifications may be seen, and quantities and forms of tender obtained, on application at the offices of Mr. George Winter, Borough Surveyor, Town Hall.

AUGUST 28. — **Rochdale.**—SLUDGE PRESSES.—Rochdale Paving, etc., Committee invite tenders for the supply, delivery, and erection of two sludge presses. Plans and particulars can be seen, and form of tender obtained, at the office of Mr. S. S. Platt, M.Inst.C.E., Borough Surveyor, Town Hall, on payment of a deposit of 5*l.*

AUGUST 30. — **Kendal.**—FILTERS.—Kendal Corporation invite tenders for the construction of three circular filters, etc., at the Sewage Disposal Works. Drawings and specifications may be seen, and bills of quantities obtained, on application at the office of Mr. F. W. Oxberry, C.E., Borough Engineer and Surveyor, Town Hall, Kendal.

AUGUST 31.—**Finchley.**—PLANT.—Finchley U.D.C. invite tenders for the supply and erection of one surface condensing plant of about 2,500 sq. ft. cooling surface. Plans may be seen, and conditions, specification, and form of tender obtained, at the office of the Electrical Engineer to the Council (Mr. E. Calvert), Electricity Works, Squires-lane, Finchley, N., on payment of 2*l.* 2s.

✱ SEPTEMBER 4. — **Dartford.**—HOT-WATER SUPPLY.—The Metropolitan Asylums Board invite tenders for alterations and extensions of hot-water supply system, cold water supply mains, and heating of linen rooms at the Gore Farm Hospitals, near Dartford, Kent. For further particulars refer to an advertisement in this issue.

SEPTEMBER 9. — **Milton.** — WEIGHBRIDGE. — Milton U.D.C. invite tenders for the supply and fixing of a self-contained wagon weighbridge. Mr. Jno. Dixon, jun., Clerk to the Council, Town Hall, Milton-next-Sittingbourne.

SEPTEMBER 14.—**Cardiff.**—HEATING.—Cardiff Guardians invite tenders for the provision of steam radiators, etc., in accordance with specification prepared by Mr. S. W. Allen, M.Inst.M.E., and conditions of contract annexed to the form of tender, to be obtained from Mr. Arthur J. Harris, Clerk, Union Offices, Queen's-chambers, Cardiff.

SEPTEMBER 16.—**Bishop's Stortford.**—GAS ENGINE, ETC.—Bishop's Stortford U.D.C. invite tenders for supplying and fixing gas engine, suction gas plant, pumping machinery, and pumps at their Waterworks. Printed specifications and forms of tender will be forwarded on application to Mr. Thos. Swatheridge, Clerk to the Council, Council Offices, 7, North-street, Bishop's Stortford, accompanied by a deposit of 1*l.* 1s.

SEPTEMBER 17.—**Acton.**—WELL.—Acton D.C. invite tenders for the sinking of a tubular well at their Public Baths in Salisbury-street, Acton, together with provision for the carrying out of temporary pumping experiments. Particulars and forms of tender, etc., may be obtained from the Surveyor, at whose office the plan of the existing bath buildings may be inspected.

OCTOBER 19. — **Canton, China.** — BRIDGE. — The Canton River Bridge Company, Ltd., invite tenders for the construction and erection of a steel cantilever and girder bridge in the front reach, Canton, on a site about 740 ft. to the west of the Dutch-folly-Fort. The general conditions, specifications, drawings, form of tender, and all other information may be obtained at the offices of Mr. William Danby, M.Inst.C.E., Hongkong and Canton, or at the following agencies of the Chartered Bank of India, Australia, and China, viz.:—London, Paris, Hamburg, or New York. A charge of $250·00 (Mex.) will be made for the specification and set of drawings.

No DATE.—**Threlkeld.**—SINKING ENGINE SHAFT.—Threlkeld Mines, Ltd., Threlkeld, near Penrith, invite tenders for the sinking of a main engine shaft, 15 or 25 fathoms as agreed, 16 ft. long by 5 ft. wide, in clay slate rock. Fuller particulars can be obtained at the offices on the mine or by applying to Mr. W. H. Borlase, Greenside Lodge, near Penrith.

MISCELLANEOUS.

AUGUST 26. — **Alton.** — STEAM ROLLING. — Alton R.D.C. invite tenders for steam rolling during ensuing season at per day, including watering and sweeping. Mr. A. F. M. Downie, Clerk, Alton, Hants.

AUGUST 27. — **Beaconsfield.** — CARTING, ETC.—The U.D.C. of Beaconsfield invite separate tenders:—(1) For the supply of a suitable horse for carting materials; (2) for the carting of ballast from Long Bottom (at per cubic yard), and depositing the same on roads. Further particulars can be obtained of the surveyor, Mr. J. Honour, Beaconsfield.

AUGUST 27. **South Molton.**—ROAD ROLLERS.—The South Molton R.D.C. invite tenders for the hire of three steam road rollers. Mr. Fred. Day, Clerk.

AUGUST 28.—**Darlington.**—CIRCULAR STAIRCASES.—For supplying only in Darlington two circular wooden staircases. For particulars apply to Mr. J. E. Chilton, architect, High-row, Darlington.

AUGUST 28.—**Mullingar.**—LABORATORY EQUIPMENT.—Estimates are required from competent contractors for laboratory equipment of new science hall, St. Mary's College, Mullingar. Sufficient information to enable contractors to draw up their specifications and estimates can be obtained on application to Rev. J. Kelly, C.C., The Palace, Mullingar (Hon. Secretary, St. Mary's "Golden Jubilee Committee").

AUGUST 28.—**Romney Marsh.**—STEAM ROLLING.—Romney Marsh R.D.C. invite tenders for the hire of two 10-ton steam rollers. Mr. William B. Smith, District Manager, New Romney.

AUGUST 29. — **Otterden.** — FENCE. — Hollingbourn R.D.C. invite tenders for the erection of a new oak post and rail fence on the Bunce Court-road in the Parish of Otterden. Specifications can be obtained at the Offices of the Council, No. 33, Earl-street, Maidstone.

AUGUST 31. — **Hawarden.**—BOWLING GREEN.—The Bowling Green Committee of Hawarden Institute, Hawarden, invite tenders for soil shipping, excavating, filling, levelling, etc., to be executed for the making of a bowling green, on a site behind the Institute at Hawarden. Drawing may be seen, and specification and quantities may be obtained, on application to Mr. H. Cockroft, Hon. Secretary, Hawarden.

AUGUST 31. — **Kenilworth.** — STREET SWEEPER. — Kenilworth U.D.C. invite tenders for the supply and delivery of a street sweeper and two tumbler carts. Specifications and forms of tender can be obtained from Mr. Sholto Douglas, Surveyor to the Council, Council Offices, Kenilworth.

SEPTEMBER 3. — **Monkstown, Ireland.** — READING DESK.—The Dean's Grange Joint Burial Board invite tenders for supplying one oak reading desk for mortuary chapel, in accordance with drawing and specification, to be seen at the Registrar's office during office hours. Mr. W. Burnell, Clerk to the Burial Board.

SEPTEMBER 3.—**Woodford.**—STEAM ROLLING.—Woodford U.D.C. invite tenders for the hire of steam rollers and scarifiers. Particulars may be obtained upon application to Mr. William Farrington, Surveyor to the Council, Council Offices, Woodford Green.

✱ SEPTEMBER 4. — **East Ham.** — FURNITURE. — The East Ham T.C. invite tenders for the supply of furniture and fittings for the new central Carnegie library in High-street South. For further particulars see advertisement in this issue.

SEPTEMBER 4. — **Sunderland.** — ROAD ROLLER. — Sunderland Corporation invite tenders for the supplying and fitting of a new Low Moor iron firebox and new steel tubes into loco. type boiler of steam road roller, and overhauling and putting the roller into thorough working order. Further particulars may be obtained from Mr. John W. Moncur, Borough Engineer, Town Hall, Sunderland.

SEPTEMBER 5.—**Sunderland.**—LENGTHENING SHOOT.—The Corporation of Sunderland invite tenders for the lengthening of shoot, etc., at Deptford manure tip. Drawing and form of tender may be obtained from Mr. John W. Moncur, Borough Engineer, Town Hall, Sunderland.

SEPTEMBER 6. — **Warrington.** — ASPHALT WORK. — Warrington Education Committee invite tenders for the covering of playgrounds, etc., at the "Bolton" Council School, Latchford, Warrington, with asphalt, concrete laid in situ, or any approved patent form of paving. The specification and form of tender may be obtained from the architects (Messrs. J. E. Wright, Garnett, & Wright, 45, Sankey-street, Warrington).

SEPTEMBER 7.—**Camberley.**—STEAM ROLLER.—Frimley U.D.C. invite tenders for supplying or hiring of 12-ton steam rollers. Further particulars can be obtained from the Council's Surveyor, Mr. T. Clement Jones, C.E., Municipal Buildings, Camberley.

SEPTEMBER 9. — **Dublin.**—CABLES.—Dublin Lighting Committee invite tenders for the supply of extra high-pressure and low-pressure cables. Specifications, with general conditions and form of tender, can be obtained from the City Electrical Engineer, Fleet-street, Dublin, on payment of 1*l.* 1s.

SEPTEMBER 9. — **Salford.** — MOTOR AMBULANCE.—Salford Corporation invite tenders for the supply and delivery of a motor ambulance van, complete, full particulars of which can be obtained on application to the Chief Officer, Central Fire-station, Crescent, Salford.

SEPTEMBER 11.—**Dorset.**—STEAM ROLLING.—The C.C. of Dorset invite tenders for steam rolling and scarifying, etc., the rural main roads of the county for the year ending March 31, 1908. Specification and forms of tenders and any further particulars can be obtained from Mr. Walter J. Fletcher, County Surveyor's office, Wimborne, Dorset.

SEPTEMBER 14. — **Cardiff.** — TELEPHONES. — Cardiff Guardians invite tenders for provision of telephones, necessary wiring, switchboard, etc., and alteration of present telephone service at their cardiff and Ely Workhouses. Particulars and form of tender may be obtained from Mr. Arthur J. Harris, Clerk, Union Offices, Queen's-chambers, Cardiff.

No DATE.—**Rearsby.**—PLASTERING.—To plaster a house at Rearsby. Labour only. Mr. W. Langton, Thrussington.

PAINTING, etc.

AUGUST 26. — **Nottingham.**—PAINTING, ETC.—Nottingham Estates Committee invite tenders for outside painting, etc., at properties situate St. Ann's-street, Windsor-street, and William-street; shops and dwellings, Hockley; dwelling-houses, Cumberland-place, Mount-street; public reading-rooms, Lenton and Hucknall-road; cemetery cottages, Derby-road; and dwelling-houses, Northville-street. Specifications, forms of tender, and bills of quantities may be obtained on application at the City Architect's offices on payment of a deposit of 10s. for each contract.

AUGUST 26. — **Polstead.** — PAINTING, ETC. — West Suffolk Education Committee invite tenders for painting and small repairs to Polstead Council School. Specification and form of tender may be obtained on application to Mr. A. Ainsworth Hunt, Architect, Shire Hall, Bury St. Edmund's, or Sudbury.

AUGUST 27.—**Barrow-in-Furness.**—DECORATION OF CHURCH.—The several works required in the decoration of St. Matthew's Church, Barrow-in-Furness. Form of tender and all particulars on application to Mr. J. H. Martindale, F.R.I.B.A., architect, Eaglesfield Abbey Rooms, Castle-street, Carlisle.

AUGUST 27. — **Bradford.**—PAINTING, ETC.—Bradford Corporation invite tenders for painting and cleaning at the following, viz.:—(1) City Hospital, Leeds-road; (2) City Hospital, Bierley Hall; (3) Faxfleet-street dwellings. Specifications and forms of tender may be obtained on application to the City Architect, Whitaker-buildings, Brewery-street, Bradford.

AUGUST 28. — **Nottingham.** — PAINTING.—Nottingham Castle Museum and School of Art Committee invite tenders for external painting at the Castle Museum. Copies of the specifications, bills of quantities, and forms of tender may be obtained from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1*l.* 1s.

AUGUST 28. — **Rochdale.** — PAINTING. — Rochdale General Purposes Committee invite tenders for painting required to be done on the outside of the Town Hall. Further particulars may be had on application to Mr. S. S. Platt, Borough Surveyor, Town Hall.

AUGUST 30. — **Levenshulme.** — PAINTING, ETC.—Levenshulme U.D.C. invite tenders for the painting and decorating required to the interior of the Council's Offices, Stockport-road, Levenshulme. Specification and ferm of tender may be obtained on application to Mr. James Jepson, Guardian-chambers, Tiviot Dale, Stockport, Surveyor to the Council.

AUGUST 31.—**Hertford.**—PAINTING.—Hertford Guardians invite tenders from painters and decorators residing within the Union for painting the exterior of the Workhouse, Workhouse Infirmary, infectious wards, and tramp wards. The specification can be seen, and full particulars of the work to be done obtained, by personal application to the Master of the Workhouse, Ware-road, Hertford.

SEPTEMBER 2.—**Bristol.**—CLEANING, PAINTING, ETC.—Bristol New Streets Committee invite tenders for cleansing, painting, etc., of workmen's dwellings. Specifications and forms of tender may be obtained at the offices of the City Engineer, 63, Queen-square, Bristol, on payment of 10s. The plans of the several buildings may be examined at 63, Queen-square, and the buildings viewed at reasonable hours on application.

SEPTEMBER 2.—**Dublin.**—PAINTING.—Dublin Estates and Finance Committee invite tenders for the repainting of the Court House, Green-street, according to specification, copy of which can be had at office of Mr. Edmund W. Eyre, City Treasurer, Secretary, Municipal Buildings, Cork Hill, on payment of 1*l.*

SEPTEMBER 3. — **Mere Knolls.** — PAINTING.—Monkwearmouth Shore, Monkwearmouth, and Fulwell Burial Board invite tenders for painting, etc., at Mere Knolls Cemetery. Specification may be seen, and form of tender obtained, at the Borough Surveyor's office, Town Hall, Sunderland.

SEPTEMBER 3.—**New Malden.**—PAINTING.—Maldens and Coombe U.D.C. invite tenders for painting the external wood and iron work at the Council Offices, etc., New Malden. Specification of the work required to be done can be seen at the office of the Engineer and Surveyor to the Council, Mr. T. B. Simmons, Council Offices, New Malden.

No DATE.—**Meltham.**—PAINTING.—Colne and Holme Joint Isolation Hospital invite tenders for the exterior painting, etc., of all the buildings comprising the Fever Hospital, Meltham. Specifications may be obtained from Mr. David J. Bailey, Clerk to the Committee, Yorkshire Bank Chambers, Huddersfield.

No DATE.—**Wakefield.**—PAINTING.—The painting or painting and tarring of the roof and exterior of the Wakefield Hippodrome. Further particulars apply Mr. Walter Emmett, Southgate, Wakefield.

ROADS, SANITARY, AND WATER WORKS.

AUGUST 26. — **Aldeburgh, Suffolk.**—DRAINAGE.—Contractors for sea-coast and drainage works are invited to send in their names for the execution of marsh drainage works for Capt. F. Vernon-Wentworth, R.N., Mr. Thos. Miller, M.Inst.C.E., 9, Thoroughfare, Ipswich.

AUGUST 26. — **Halifax.** — SEWER. — Halifax Highways Committee invite tenders for the construction of a 12-in. pipe sewer in Upper Washer-lane. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax, upon payment of the sum of 1*l.*

AUGUST 26. — **Leeds.** — PAVING AND FLAGGING. — Leeds Highways Committee invite tenders for paving and flagging of streets. Drawings may be seen at the City Engineer's office, Municipal Build-

ings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall-road.

AUGUST 27.—**Clayton.**—PIPE SEWER.—The Clayton U.D.C. invite tenders for the construction of about 113 yds. of 9-in. earthenware pipe sewer, with manholes and lampholes. Drawings and specifications may be seen, and forms of tender obtained, at the office of the Clayton U.D.C.

AUGUST 27.—**Gateshead.**—PAVING, ETC.—Gateshead Corporation invite tenders for paving, etc., streets. Plans and specifications may be seen, and quantities obtained, at the office of Mr. N. P. Pattinson, Borough Engineer, Town Hall, Gateshead.

AUGUST 28. — **Carrickfergus.**—SEWERAGE.—Larne R.D.C. invite tenders for carrying out work connected with a scheme of sewerage for the shore or Belfast Road District, Carrickfergus. Plan, specification, and general conditions can be seen either at the Workhouse, Larne, or at the office of the engineer, Mr. W. D. R. Taggart, C.E., 51 and 52, Scottish Provident Buildings, 2, Wellington-place, Belfast, and form of tender obtained.

AUGUST 28. — **Cheeseburn Grange.** — WATER SUPPLY.—Tenders wanted for making of an underground service reservoir at Stob Hill, to hold 21,000 gallons, in cement concrete. Plans, drawings, and specification may be seen at the office of Mr. Edward Brown, civil engineer, 7, Clayton-street West, Newcastle-on-Tyne. Quantities and form of tender will be supplied on payment of 1*l.* 1s.

AUGUST 29. — **Greetland.**—ROAD WORKS.—Greetland U.D.C. invite tenders for :—(1) Setts, flags, and kerb; (2) labour necessary in forming Princess-street, North-street, and George-street, West Vale. Plans and specifications may be seen, and separate bills of quantities obtained, at offices of Messrs. Richard Horsfall & Son, 22A, Commercial-street, Halifax.

AUGUST 29. — **Hexham.** — SEWERAGE. — Hexham R.D.C. invite tenders for the laying of about 900 lin. yds. of 9-in. pipe sewer, with manholes and flushing arrangements complete, together with outfall works at Hedley-on-the-Hill. Plans and specifications may be seen, and quantities and other particulars obtained, on application to the engineer, Mr. Alfred S. Dinning, 21, Ellison-place, Newcastle-on-Tyne, on depositing 1*l.* 1s.

AUGUST 30.—**Overstrand.**—SEWER.—For extending the sewer at Overstrand. Plans and specifications to be seen, and quantities obtained, at the offices of Mr. A. F. Scott, F.S.I., 24, Castle-meadow, Norwich.

AUGUST 30.—**Wombwell.**—WATER MAINS.—Wombwell U.D.C. invite tenders for the supply of 606 yds. of 8-in. cast-iron pipes, and 897 yds. of 6-in. cast-iron pipes, together with sundry cast-iron specials. Forms of tender, with full particulars of the Council's requirements and the conditions of contract, may be had on application to Mr. W. A. Burton, Waterworks Engineer, Wombwell.

AUGUST 31. — **Bletchley.** — NEW STREET. — For making, kerbing, sewering, and draining new streets at Bletchley, for Mr. Fred. Tanqueray. Plans may be seen, and copies of specifications and bill of quantities obtained, from Mr. John Chadwick, civil engineer, Bletchley, upon a deposit of 1*l.* 1s. being paid.

AUGUST 31. — **Wakefield.**—STREET WORKS.—Wakefield Corporation invite tenders for the carrying out of private street works in Providence-place. Plans, specifications, and conditions may be seen, and forms of tender and any other information obtained, at the City Surveyor's Office.

SEPTEMBER 2. — **Bolton-upon-Dearne.** — PRIVATE STREET WORKS.—For Victoria-street, Goldthorpe, and two back roads, Highgate, private street works. Specifications, bills of quantities, and any other information may be obtained from the surveyor at his office, upon a deposit of 1*l.* 1s.

SEPTEMBER 2.—**Brierley, Hemsworth.**—SEWERAGE.—The R.D.C. of Hemsworth invite tenders for the construction of sewage-disposal works at Brierley. Plans, sections, and specifications may be seen at the office of Mr. T. H. Richardson, surveyor, at Hemsworth.

SEPTEMBER 2.—**Mansfield.**—PUMPING MAIN.—Mansfield Corporation invite tenders for providing and laying a 15-in. cast-iron pumping main, about four and three-quarter miles in length, from the new pumping station at Clipstone. The drawings and specification may be seen at the office of the engineers, Messrs. George & F. W. Hodson, MM.Inst.C.E., Loughborough, and copy of the schedule of quantities and tender form obtained from them on deposit of a cheque for 5*l.* 5s.

SEPTEMBER 3. — **Gosforth.** — TAR MACADAMISING. — Gosforth U.D.C. invite tenders for tar macadamising the carriageway and relaying channels, etc., in Hedley-street. All particulars may be obtained from Mr. Geo. Nelson, A.M.Inst.C.E., Engineer and Surveyor to the Council, Council Chambers, High-street, to whom applications should be made for quantities.

SEPTEMBER 3. — **Salisbury.** — ROAD WORKS. — New Sarum T.C. invite tenders for executing certain works of sewering, levelling, paving, etc. Plans and specifications can be seen at the office of the City Surveyor, Endless-street, between the hours of 11 a.m. and 1 p.m. Forms to be obtained on application at the City Surveyor's office.

SEPTEMBER 3. — **Wiveliscombe.** — SEWER.—Tenders are invited by the U.D.C. of Wiveliscombe for the construction of new intercepting sewers, about 190 yds. in length, in accordance with plans and specification prepared by Mr. T. H. Andrew, F.S.I., of Williton. The Council also invite tenders for the laying of an inch galvanised iron water pipe, distance about 840 ft. The plans, specifications, and forms of contract can be inspected by appointment at the Council's Offices in Wiveliscombe.

SEPTEMBER 4.—**Hove.**—PAVING.—Hove Corporation invite tenders for executing, paving, and other works in Shoreham-road (between Carlisle-road and Langdale-road), and in Portland-villas. Further particulars may be obtained, and plans and specifications seen, at the office of the Borough Surveyor (Mr. H. H. Scott).

SEPTEMBER 4.—**Lurgan.**—SEWERAGE SYSTEM.—Lurgan Guardians invite tenders for laying down a new sewerage system, including plumbing work and the provision of sanitary annexes at the Workhouse, Lurgan, in accordance with the plans and specification prepared by Mr. J. Finlay Peddie, C.E., M.E., which may be seen on application to Mr. James Calvert, Clerk of Union, Union Workhouse, Lurgan. A copy of the specification may be obtained on payment of a fee of 1*l.* 1s.

SEPTEMBER 7.—**North Shields.**—ROAD WORKS.—Tynemouth Corporation invite tenders for the construction of the extension (some 800 yds. in length) of Queen Alexandra-road, North Shields. Drawings and specification may be seen at the offices of Mr. John F. Smillie, Borough Surveyor, Tynemouth.

SEPTEMBER 7. — **Stretford.**—STREET WORKS.—Stretford U.D.C. invite tenders for paving with granited rock, asphalt, etc., passages. The drawings and specification may be seen, and forms of tender, with schedule of quantities and other particulars, obtained, on application to Mr. Ernest Worrall, the Council's Surveyor, on payment of a deposit by cheque of 2*l.* 2s.

SEPTEMBER 7.—**Tynemouth.**—ROAD WORKS.—Tynemouth Corporation invite tenders for the construction of the extension (some 800 yds. in length) of Queen Alexandra-road, North Shields. Drawings and specification may be seen at the offices of Mr. John F. Smillie, Borough Surveyor, Tynemouth.

SEPTEMBER 10. — **Barking Town.** — DRAINAGE.—Barking Town U.D.C. invite tenders for the construction of 245 lin. yds. of 15-in. diameter patent jointed stoneware pipe sewer and 245 lin. yds. of 15-in. diameter stoneware pipe surface-water drain in connexion with the Upney Valley drainage. Plans, etc., can be seen, and specification, form of tender, etc., obtained, upon application to Mr. C. F. Dawson, Surveyor to the Council, Public Offices, Barking.

SEPTEMBER 10. — **Southampton.** — ROAD WORKS.—Southampton Corporation invite tenders for executing the following works, viz. :—(1) Kerbing, channelling, and storm-water drainage; (2) removal of sewer pipe from River Itchen. Plans, specifications, and conditions may be inspected, and forms of tender and bills of quantities obtained, at the Borough Engineer's Office, upon production of the Borough Treasurer's receipt for a deposit of 2*l.* 2s. in respect of each contract.

SEPTEMBER 14.—**Horsham.**—RELEVELLING, ETC.—The Governors of Horsham Grammar School invite tenders for the following work to be carried out at the school premises, viz. :—To relevel, drain, chalk, and return cricket and football field; to grub hedges, etc. Particulars, plans, and specifications can be seen at the office of Mr. G. B. Simpson, 4, Carfax, Horsham. Copies of plans and specification can be had on payment of 7s. 6d.

SEPTEMBER 16. — **Dundee.**—STOBSMUIR RESERVOIR.—Dundee Water Commissioners invite tenders for additions to Stobsmuir Reservoir, and for re-roofing with concrete and expanded metal decking carried by castiron columns, rolled steel joists, and steel channel irons. They are also prepared to consider alternative offers for Hennebique's or other ferro-concrete patent system. Drawings, specifications, schedule of quantities, and form of tender may be obtained at the office of Mr. George Baxter, C.E., M.Inst.C.E., engineer and Manager, Water Engineer's Office, 93, Commercial-street, Dundee, upon payment of the sum of 5*l.* 5s.

SEPTEMBER 16.—**London.**—REPAVING.—Bermondsey B.C. invites tenders for the repaving of Crucifix-lane with granite setts. Plans and specification may be seen, and forms of tender obtained, on application to Mr. R. J. Angel, M.Inst.C.E., Borough Surveyor.

STONE, MATERIALS, AND STORES.

AUGUST 26.—**Chertsey.**—ROAD MATERIAL.—Chertsey R.D.C. invite tenders for the supply of road materials for six months, commencing on October 1, 1907. Forms of tender and the description of the various materials and the estimated quantities that may probably be required may be obtained of Mr. W. Durrant, surveyor, Spinney Hill, Addlestone.

AUGUST 26.—**Teddington.**—GRANITE KERB, ETC.—The U.D.C. of Teddington invite tenders for the supply of granite kerb, granite channel, etc. Mr. G. H. Salmons, Clerk, Elmfield House, Teddington.

AUGUST 27. — **Burton-upon-Trent.** — LIME.—The Corporation invite tenders for the supply of lime for sewage treatment at the Corporation Pumping Station, Clay Mills, Burton-upon-Trent. Forms of tender may be obtained at office of Mr. George T. Lynam, Borough Engineer and Surveyor, Town Hall.

AUGUST 27.—**Stamford.**—GRANITE.—Stamford T.C. invite tenders for about 500 tons of X and 500 tons of XX broken granite. Mr. Fredk. R. Ryman, A.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Stamford.

AUGUST 29. — **Uxbridge.** — OIL.—Uxbridge R.D.C. invite tenders for the supply and delivery of 7,000 gallons of "Rock Light" oil into the tanks at Cowley Sewage Disposal Works. For further information apply to Mr. J. Freebairn Stow, the Council's Engineer and Surveyor, Corn Exchange, Uxbridge.

AUGUST 31.—**Lymington.**—GRANITE.—The T.C. invite tenders for the supply and delivery (by rail or water) of about 225 tons of Guernsey, Cornish, or other granite, and about 25 tons of granite chippings. Tenders (without forms) to be sent to Mr. J. Davis Rawlins, Town Clerk, Town Clerk's office, Lymington, Hants.

SEPTEMBER 2. — **Hampton.** — MATERIALS.—Hampton U.D.C. invite tenders for the supply of :—(2) Fifty (more or less) cast-iron hinged gully grates and frames; (3) one road-sweeping machine; (4) fifteen dozen (more or less) best scavengers' bass brooms. Forms of tender, conditions, and all particulars can be obtained from Mr. Sidney H. Chambers, Surveyor to the Council, Public Offices, Hampton, Middlesex.

SEPTEMBER 3. — **Bridgend.** — SUPPLIES.—The Committee of Visitors of the Glamorgan County Asylum invite tenders for the supply and delivery of material for masons, engineers, and painters for periods of three and six months from October 1, 1907. Forms of tender and any information may be obtained on application to the Clerk and Steward.

SEPTEMBER 3. — **Woodford.** — GRANITE. — Woodford U.D.C. invite tenders for the supply of broken Quenast or Guernsey granite. Mr. William Farrington, Surveyor to the Council, Council Offices, Woodford Green.

SEPTEMBER 7. — **Bedford.** — GRANITE.—Bedford Corporation invite tenders for the supply of about 2,000 tons of broken granite for road-making. Forms of tender and further particulars as to gauge, etc., can be obtained on application. Mr. Hedley Baxter, Town Clerk, Town Hall.

SEPTEMBER 12.—**Bradford.**—STORES.—The Gas Committee invite tenders for the supply of stores required in their several departments during a period of one year. Forms of tender, with any further information required, may be had on application to Mr. Chas. Wood, Gas Engineer, Town Hall, and samples may be seen at Mill-street Gasworks.

SEPTEMBER 12. — **Whalley.** — BRICKS. — Lancashire Asylums Board invite tenders for the manufacture of the bricks which will be required for the erection of the new asylum at Whalley, near Blackburn, Lancashire, from the clay found on the site. Further particulars, including form of tender, with conditions and specification, may be obtained upon application to Mr. Harcourt E. Clare, Clerk to the Lancashire Asylums Board, County Offices, Preston, accompanied by a deposit of 2*l.*

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	Aug. 28
*STEAM JOINER'S STOCK-IN-TRADE, WOLVERHAMPTON—On the Premises	Nock & Joseland	Sept. 2
*BRICKFIELDS—At the Southchurch Brickfields, Shoeburyness	Fuller, Horsey, Sons, & Cassell	Sept. 17
*QUARRY PLANT, MACHINERY, ETC., IRELAND—Quarries, Doonagore	Matcham & Co.	Sept. 18
*ORLEANS HOUSE, TWICKENHAM—At the Mart	Marler & Marler	Oct. 7

PATENTS.—*Continued from page* 230.

24,053 of 1906.—J. HACKSTEIN: *Producing Floors, Ceilings, and Walls.*

This relates to the flooring or planking of walls and ceilings, and is characterised in that the separate planks are removably attached to hollow metal rails by means of metal plates, which latter are attached to the planks in a suitable manner.

25,876 of 1906.—E. M. HOWE: *Telescopic Ladders.*

This relates to a lock or catch for telescopic ladders, and comprises the combination of a lever pivoted at an intermediate point in its length on the sliding section, one end or arm of said lever being adapted to engage the rings of the fixed section, and the other end or arm being weighted so that said lever is normally maintained in a horizontal or approximately horizontal or engaging position, and stops against which said lever bears when in engaging position, said stops being also adapted to take up the weight of the sliding section and relieve the pivot of the lever thereof.

27,053 of 1906.—W. OSMENT: *Method of and Appliances for Securing in Position the Panels of Door and other like Frames.*

This consists in the combination in and with a door or other like frame, a base secured to the frame, one side of a moulding formed with the base, and a tongue running along the base of another side of a moulding corresponding with the former moulding, and a groove running along the latter moulding to receive the tongue, between which two mouldings the edge of the panel can be received.

27,676 of 1906.—W. A. PICKFORD: *Draught, Dust, and Weather Excluder for the Bottom of Doors.*

This relates to draught, dust, and weather excluders for doors, and comprises the combination with interengaging levers serving to sustain a movable portion of the excluder in its elevated position when the door is open, of a rod operated from the door and engaging one of said levers for depressing said movable portion of the excluder on the closing of the door.

2,162 of 1907.—E. F. WELLS and J. N. LUMMUS: *Registering Locks.*

This relates to an indicating lock having indicator bars carrying friction pawls for locking the bars in adjusted positions, and arranged to be engaged by a restoring plate which releases the friction pawls and returns the indicator bars to the zero position, the restoring plate being held by another pawl, which latter is engaged by the key to cause the release of the restoring plate to return the indicator bars to the zero position, after which the pawl moves into the path of the key and prevents its retrograde movement, and then the key engages the indicator bars and moves them to new positions where they are held by the friction pawls.

7,272 of 1907.—M. V. BARKER: *Stoves.*

This relates to a stove of the kind having a fire box and an ash box below the fire box, open at one end and having a top forming the bottom of the fire box, and provided with an opening, the box being adapted to receive an ashpan comprising a bar extended across said opening, guides attached to the bottom of the fire box, a longitudinal movable slide engaged by said guides and co-acting with said opening to cut off or establish communication between the fire box and the ash box, an ash pan in the ash box slidable into and out of the same through the open end thereof, and having a flange at its front end, said flange having an opening to clear the slide, and through which the latter projects when the ash pan is in place, the slide and the ash pan being each removable independently of the other.

7,782 of 1907.—E. VANDERSTEGEN: *Window Sashlines and the like.*

This relates to a window, and consists in the interposition of a spring or the like between the sash weight and sash.

8,941 of 1907.—J. C. TOMLINSON: *Latches and Locks for Doors and the like.*

This relates to a latch and lock (principally to latches or locks of the kind which can be inserted into the face of the door and be fixed in position without any attendant difficulties, which accompany the use of the ordinary mortise lock) in which the handles and handle spindle are central with regard to the face plates and to the bolt shoot mechanism, the locking mechanism being contained in a space immediately behind one of the face plates.

17,185 of 1906.—S. LAKE: *System of Driving Piles under Water.*

This relates to a subaqueous pile-driving system, and comprises the combination with a semi-submergible vessel of a tube serving to guide the hammer and piles and extending from alongside the working compartment of the submergible portion of the vessel up to the surface.

23,375 of 1906.—A. WOLFSHOLZ: *Process for Manufacturing Articles such as Artificial and other Building Materials from Cement, Concrete, and the like.*

This relates to an apparatus for use in the manufacture of articles such as artificial stones and other building materials from cement, concrete, and the like formed in the apparatus under pressure, and comprises the arrangement of air-cocks, said air-cocks being open during the filling operation and subsequently closed, and to the method of providing the said articles with mosaic or other face plates, consisting in arranging on the bottom of the apparatus small mosaic stones or other components adapted to form a face plate and subsequently closing up said apparatus and forcing in the cement, concrete, or the like.

25,528 of 1906.—L. H. RENTZSCH: *Manufacture of Reinforced Moulded Cement and like Pipes and other Hollow Bodies.*

This relates to a tubular or hollow body made from plastic material with the addition of organic or inorganic fibres if desired, the body being formed by applying the plastic material centrifugally to an insertion of expanded metal.

27,923 of 1906.—RANSOME & SMITH COMPANY: *Machines for Mixing Concrete.*

This relates to a concrete-mixing machine, and comprises the combination of an oscillatable chute with a rotatable drum the interior of the annular surface of which is formed with alternating mixer blades arranged to centralise the load between the drum-ends and thereby minimise outward splashing, and also arranged to produce ways for the flow of water and light particles, and thereby make the drum approximately self-cleaning.

1,502 of 1907.—J. VORRABER: *Presses for Moulding Artificial Stone Slabs and the like.*

This relates to a moulding-press of the kind in which the articles which are moulded are compressed from the lower and upper sides, and is characterised in that an upper and a lower stamper connected by levers move towards each other in such a way that the pressure which is exercised on the one stamper below results in a counter-pressure or movement of the other stamper against the material which is in the mould at a different speed according to the distance of leverage.

2,442 of 1907.—J. LAEUFER: *Composition for Use as a Substitute for Wood or Stone or for like purposes.*

This relates to substitute material for wood, stone, or the like, consisting of vegetable matter, Portland cement, plaster of Paris, and swine blood.

7,518 of 1907.—J. B. BLAW: *Moulds for Use in the Construction of Sewer Conduits and the like.*

This relates to a mould comprising a plurality of sections of thin sheet metal removably secured together at the edges by flanged stiffening sections, and provided with radially-directed stiffening and collapsing braces extending from the edges of the mould to the flanges of the stiffening sections.

TO CORRESPONDENTS.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 8.—By OSBORN & MERCER (at Brighton).	
Buxted, Sussex.—Farms and accommodation land, 128 acres, f.	£3,805
Heathfield, Sussex.—Agricultural holding, farm and building land, 60 acres, f.	3,550
August 9.—By G. B. HILLIARD & SON (at Chelmsford).	
South Hanningfield, Essex.—Little Preston's Farm, 124 a. 1 r. 29 p., f.	1,600
West Hanningfield, Essex.—Three cottages, 3 a. 2 r. 36 p., f.	300
Danbury, Essex.—Blue House Farm, 16½ acres, f.	550
August 12.—By E. G. RIGHTON & SON (at Evesham).	
Sedgeberrow, Worcester.—Freehold farm, 183 a. 1 r. 6 p.	4,000
Eight freehold cottages	600
August 13.—By WYATT & SON (at Havant).	
South Hayling, Hants.—West-la., 1 and 2, Oakvillas, u.t. 67 yrs., g.r. 5*l.*, y.r. 40*l.*	400
By DANIEL SMITH, SON, & OAKLEY (at Hazelbury Bryan).	
Hazelbury Bryan, Dorset.—Farmhouses, etc., 141 a. 0 r. 36 p., f.	6,400
Holwell, Dorset.—A holding and two cottages, 27 a. 0 r. 2 p., f.	1,110
August 14.—By ALFRED BOWYER & JONES.	
Enfield.—Botany Bay, "The Hollies," 2¼ acres, u.t. 11 yrs., g.r. 18*l.*, p.	300
By ELLIS & SON.	
Norwood.—Norwood-rd., f.g.r. 15*l.*, reversion in 55 yrs.	420
St. Faith's-rd., f.g.r. 20*l.*, reversion in 63 yrs.	550
August 15.—By HARPER, WALTON, & CO.	
Chelsea.—1, Walpole-st, u.t. 33 yrs., g.r. 10*l.* 3s., e.r. 75*l.*	521
By STIMSON & SONS.	
Clapham.—98, Edgley-rd., u.t. 96 yrs., g.r. 8*l.* 10s., p.	230
74, 76, and 78, The Chase, u.t. 95 yrs., g.r. 105*l.*, w.r. 498*l.* 14s.	375
80 and 82, The Chase, u.t. 95 yrs., g.r. 70*l.*, w.r. 332*l.* 4s.	265
Brixton.—23, Elliott-rd., u.t. 56 yrs., g.r. 6*l.*, e.r. 34*l.*	260
Croydon.—94, 95, and 96, Tamworth-rd., f., y.r. 85*l.*	1,145
Peckham.—97, Meeting House-la., f., w.r. 24*l.* 14s.	250
Lambeth.—31 and 33, Barbel-st., u.t. 29¼ yrs., g.r. 1*l.*, e.r. 80*l.*	£300
Camberwell.—74, Camberwell-rd., f., y.r. 50*l.*	530
Walworth.—18, Mann-st., u.t. 44 yrs., g.r. 4*l.* 5s., w.r. 44*l.* 4s.	280
Wimbledon.—55 and 57, South-rd. (s.), f., y. and w.r. 57*l.* 4s.	690
62, 64, and 66, South-rd., f., w.r. 59*l.* 16s.	480
58, 60, and 62, Norman-rd., f., w.r. 58*l.* 10s.	610
Limehouse.—150 and 150A, Salmon-la. (s.), u.t. 44¼ yrs., g.r. 12*l.* 12s., y.r. 80*l.*	770
Bermondsey.—3 to 10, Pleasant-pl., f., w.r. 118*l.* 6s.	540
Holborn.—19, Baldwin's-gdns. (s.), u.t. 16½ yrs. g.r. 27*l.*, w.r. 68*l.* 16s.	120
Finsbury.—111, Whitecross-st. (s.); also 1, Shrewsbury-ct., f., y. and w.r. 75*l.* 16s.	800
Brixton.—13, Hilda-rd., u.t. 56 yrs., g.r. 6*l.* 10s., y.r. 38*l.*	260
Hounslow.—68, High-st. (s.), c., y.r. 26*l.*	580

Contractions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

PRICES CURRENT OF MATERIALS.

***** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.**

BRICKS, &c.

	£	s.	d.		
Hard Stocks	1	7	0	per 1000 alongside, in river.	
Rough Stocks and Grizzles	1	6	0	,,	,, ,,
Picked Stocks for Facings	2	10	0	,,	delivered.
Flettons	1	6	0	,,	at railway depôt.
Red Wire Cuts	1	14	0	,,	,, ,,
Best Fareham Red	3	12	0	,,	,, ,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,, ,,
Best Blue Pressed Staffordshire	3	15	0	,,	,,
Do. Bullnose	4	0	0	,,	,, ,,
Best Stourbridge Fire Bricks	3	14	0	,,	,, ,,
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers	12	0	0	,,	,, ,,
Headers	11	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	16	0	0	,,	,, ,,
Double Stretchers	19	0	0	,,	,, ,,
Double Headers	16	0	0	,,	,, ,,
One Side and two Ends	19	0	0	,,	,, ,,
Two Sides and one End	20	0	0	,,	,, ,,
Splays, Chamferred, Squints	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0		,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
Splays, Chamferred, Squints	14	0	0	,,	,, ,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.

	£	s.	d.	
Thames and Pit Sand		7	0	per yard, delivered.
Thames Ballast		5	6	,, ,,
Best Portland Cement		28	0	per ton, ,,
Best Ground Blue Lias Lime		19	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	,, ,,
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1	,, ,,
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½	,, ,,

	s.	d.	
Ancaster in blocks	1	10	per ft. cube, deld. rly. depôt.
Beer ,,	1	6	,, ,,
Greenshill ,,	1	10	,, ,,
Darley Dale in blocks	2	4	,, ,,
Red Corsehill ,,	2	2	,, ,,
Closeburn Red Freestone	2	0	,, ,,
Red Mansfield ,,	2	4	,, ,,
YORK STONE—*Robin Hood Quality.*			
Scappled random blocks.	2	10	,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super., ,,
6 in. rubbed two sides ditto, ditto	2	6	,,
3 in. sawn two sides slabs (random sizes)	0	11½	,, ,,

STONE (*continued*).

YORK STONE—*Robin Hood Quality (continued)*.

2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	per ft. supr. deld. rly. dept.	
1½ in. to 2 in. ditto, ditto	0	6	,,	,,
HARD YORK—				
Scappled random blocks.	3	0	per ft. cube,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super.	,,
6 in. rubbed two sides ditto	3	0	,,	,,
3 in. sawn two sides slabs (random sizes)	1	2	,,	,,
2 in. self-faced random flags	0	5	,,	,,

SLATES.

In. In.	£	s.	d.	
20×10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d
20×12 ,, ,,	13	17	6	,, ,,
20×10 first quality ,,	13	0	0	,, ,,
20×12 ,, ,,	13	15	0	,, ,,
16×8 ,, ,,	7	5	0	,, ,,
20×10 best blue Portmadoc	12	12	6	,, ,,
16×8 ,, ,,	6	12	6	,, ,,
20×10 best Eureka unfading green	15	17	6	,, ,,
20×12 ,, ,,	18	7	6	,, ,,
18×10 ,, ,,	13	5	0	,, ,,
16×8 ,, ,,	10	5	0	,, ,,
20×10 permanent green	11	12	6	,, ,,
18×10 ,, ,,	9	12	6	,, ,,
16×8 ,, ,,	6	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. ,,
Best Broseley tiles	50	0	per 1000 ,,
Do. Ornamental tiles	52	6	,, ,,
Hip and Valley tiles	4	0	per doz. ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	,, ,,
Do. Ornamental do.	60	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	0	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 ,,
Do. Ornamental do.	54	6	,, ,,
Hip tiles	4	1	per doz. ,,
Valley tiles	3	8	,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000 ,,
Best Ornamental tiles	50	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	8	,, ,,
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 ,,
Do. pressed	47	6	,, ,,
Do. Ornamental do.	50	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	6	,, ,,

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less thn best.		
Battens: seconds	0	10	0	,,	,,	
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		
	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	4	0	0	4	15	0

JOINERS' WOOD.	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in. by 1 in.	18	10	0	20	0	0
,, ,, 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
,, ,, 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, ,, 3 in. by 9 in.	12	10	0	13	10	0
,, ,, battens	10	0	0	11	0	0
Pitch-pine: deals	18	0	0	21	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	,,		
Seconds, regular sizes	33	0	0	,,		
Yellow Pine oddments	28	0	0	,,		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £	s.	d.	£	s.	d.
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	3	0	0	3	6
Small ,, ,,	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube	0	5	6	0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	0	0	½
¾ in. do. do	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. ,, ,,	0	14	0	0	18	0
¾ in. by 7 in. white ,, ,,	0	10	0	0	11	6
1 in. by 7 in. ,, ,,	0	12	9	0	15	0
6 in. at 6d. to 9d. per square less than 7 in.						

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	7	6	7	15	0
Compound Girders, ordinary sections	9	10	0	10	10	0
Steel Compound Stanchions	12	5	0	13	5	0
Angles, Tees, and Channels, ordinary sections	9	5	0	10	5	0
Flitch Plates	9	5	0	10	5	0
Cast Iron Columns and Stanchions including ordinary patterns	8	0	0	9	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars	8	10	0	9	0	0
Staffordshire Crown Bars, good merchant quality	9	5	0	9	15	0
Staffordshire "Marked Bars"	11	0	0	—		
Mild Steel Bars	9	10	0	9	15	0
Hoop Iron, basis price	9	15	0	10	0	0
,, ,, Galvanised	17	10	0	—		
(*And upwards, according to size and gauge.)						
Sheet Iron Black—						
Ordinary sizes to 20 g.	10	0	0	—		
,, ,, 24 g.	11	0	0	—		
,, ,, 26 g.	12	10	0	—		
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16	0	0	—		
Ordinary sizes to 22 g. and 24 g.	16	10	0	—		
,, ,, 26 g.	17	0	0	—		
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	19	0	0	—		
,, ,, 22 g. and 24 g.	19	10	0	—		
,, ,, 26 g.	21	0	0	—		
Galvanised Corrugated Sheets—						
Ordinary sizes 6 ft. to 8 ft. 20 g.	16	0	0	—		
,, ,, 22 g. and 24 g.	16	5	0	—		
,, ,, 26 g.	17	10	0	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13	0	0	—		
Best Soft Steel Sheets, 22 g. & 24 g.	14	0	0	—		
,, ,, ,, 26 g.	16	0	0	—		
Cut Nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	10	15	0	11	5	0

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up.	22	12	6	—		
Pipe in coils	23	2	6	—		
Soil pipe	25	2	6	—		
Compo pipe	26	2	6	—		
ZINC—Sheet—						
Vieille Montagne ton	32	10	0	—		
Silesian	32	5	0	—		
COPPER—						
Strong Sheet per lb.	0	1	4	—		
Thin ,, ,,	0	1	5	—		
Copper nails ,,	0	1	3	—		
BRASS—						
Strong Sheet ,,	0	1	2	—		
Thin ,, ,,	0	1	3	—		
TIN—English Ingots ,,	0	1	11	—		
SOLDER—Plumbers' ,,	0	0	9	—		
Tinmen's ,,	0	0	11	—		
Blowpipe ,,	0	1	1	—		

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	1⅞d. ,, ,,
21 oz. thirds	3d. ,, ,,
,, fourths	2⅜d. ,, ,,
26 oz. thirds	4d. ,, ,,
,, fourths	3½d. ,, ,,
32 oz. thirds	5d. ,, ,,
,, fourths	4½d. ,, ,,
Fluted Sheet, 15 oz.	3½d. ,, ,,
,, 21 oz.	4½d. ,, ,,

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft. delivered.
¼ ,,	2½d. ,, ,,
⅜ ,,	3d. ,, ,,
Figured and Oxford Rolled "Oceanic" Glass, white	4d. ,, ,,
Do. ,, tinted	5½d. ,, ,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	1
,, ,, ,, in barrels	,,	0	2	2
,, ,, ,, in drums	,,	0	2	4
Boiled ,, ,, in pipes	,,	0	2	3
,, ,, ,, in barrels	,,	0	2	4
,, ,, ,, in drums	,,	0	2	5
Turpentine in barrels	,,	0	3	5
,, in drums	,,	0	3	7
Genuine Ground English White Lead	per ton	26	10	0
Red Lead, Dry	,,	24	10	0
Best Linseed Oil Putty	per cwt.	0	7	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	
Extra Pale Paper	0	12	
Best Japan Gold Size	0	10	
Best Black Japan	0	16	
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BINGLEY.—For sewering and forming, etc., of Villa-road, for the Urban District Council. Mr. H. Bottomley, Surveyor, Town Hall, Bingley. Quantities by Surveyor.
J. & W. Potter, Bingley £673 0 1

BINGLEY.—For laying 460 yds. of 9-in. pipe sewer in Glen-road, Eldwick, for the Urban District Council. Mr. H. Bottomley, Surveyor, Town Hall, Bingley. Quantities by Surveyor:—

W. Small	£601 19 10	R. Wood	£375 19 8
J. Dean & Co.	435 12 0	B. Foster & Co.	368 0 0
J. Totty	427 4 3	D. Wildman & Son, Bingley*	363 7 7
R. Naylor & Son	400 0 0		

BINGLEY.—For laying 650 yds. of 12-in. pipe sewer in Warren-lane, for the Urban District Council. Mr. H. Bottomley, Surveyor, Town Hall, Bingley. Quantities by Surveyor:—

W. Small	£714 18 0	B. Foster & Co.	£395 0 0
J. Dean & Co.	503 11 0	R. Wood	389 10 1
W. Crossland	444 17 9	D. Wildman & Son, Bingley*	367 0 0
R. Naylor & Son	438 0 0		
J. Totty	432 15 9		

BINGLEY, Yorks.—For kerbing, flagging, etc., of Wilson-road, for the Urban District Council. Mr. H. Bottomley, Surveyor, Town Hall, Bingley. Quantities by Surveyor:—

D. Wildman & Son	£360 5 0	R. Naylor & Sons	£276 0 0
J. Totty	345 18 4	R. Wood	269 5 0
E. Johnson	320 0 0	J. & W. Potter	265 10 0
W. Baker	300 0 0	B. Foster & Co., Bingley*	264 17 6

CAERGWRLE.—For the erection of a bottling store a Caergwrle, for Mr. R. N. Woollett. Mr. C. D. Rutter, architect, Parr's Bank-chambers, Wrexham. Quantities by the architect:—

E. O. Probert	£871 10 0	Jones & Son, Johnstown, Rualton*	£750 0 0
T. Jones	757 0 0		
J. B. Woolley	755 17 9		
Davies Bros.	751 7 0	W. E. Samuel‡	695 0 0

‡ Withdrawn owing to clerical error of £48.

CHERTSEY.—For making-up of Wheatash-road, Addlestone Moor, for the Urban District Council of Chertsey. Mr. T. W. Greig, Surveyor to the Council:—

G. Hebburn	£542 1 1	W. H. Wheeler	£291 2 10
S. Kavanagh	348 17 3	G. A. Franks	289 12 9
F. Hoffmann	342 2 10	W. Norris	241 0 9
W. J. Jackson	318 6 2	T. Knight & Son, Chertsey*	254 0 0
T. Free & Son	305 10 1		
J. Eley	298 8 0		

CLACTON-ON-SEA.—For erecting new office buildings in Station-road, for Messrs. E. J. Gilders & Co. Messrs. Baker & Wrightson, Clacton-on-Sea, and Mr. W. J. Almond, London, were architects. Quantities supplied:—

W. Ellis & Co.	£2,150	R. Beaumont	£1,920
C. H. Jones	2,085	Scales & Robins	1,895
G. A. Kenny	1,999	G. Dobson & Son	1,885
W. Chambers	1,989	W. Everett & Sons	1,868
T. J. Grimwood	1,987	H. Smith	1,868

As the two lowest tenders were equal, and some reductions were necessary, further tenders were obtained as follows:—

W. Everett & Sons	£1,545
H. Smith*	£1,541

ELSTREE.—For sewerage works, Boreham Wood, for Barnet Rural District Council. Mr. T. England, surveyor, Fernlea, Boreham Wood, Elstree:—
E. Potterton & Co., East Molesey, S.W.. £3,925

ERITH.—For the erection of a new police station at Erith. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, & Childgey, Charing Cross-chambers, Duke-street, Adelphi:—

Graham & Co.	£9,919	W. Blay	£9,661 0
Thomas & Edge	9,900	Lovatt Ltd.	9,388 11
Lascelles & Co.	9,873	C. Ansell	9,390 0
Harris & Wardrop	9,837	Mowlem & Co., Ltd.	9,266 0
Holloway Bros.	9,793	F. & H. F. Higgs	9,144 0
Higgs & Hill	9,764	Godson & Son	8,955 0
H. Kent	9,763		
Grover & Son	9,759		

GRANGE-OVER-SANDS.—For tar-paving works, the Promenade, for the Urban District Council. Mr. T. Huddleston, Surveyor, Council Offices, Grange-over-Sands:—

W. H. Stansbury & Co.	£828	North of England Asphalte Co.	£579
P. Smith	792	G. Hall	561
Northern Quarries Co.	739	Tarmac, Ltd.	549
J. J. Ingham	711	W. Shepherd	501
Mitchell & Clarke	646	Frith & Pendleton, Barrow-in-Furness*	435
J. Brook	640		
South Bank Slag and Tar Macadam Co.	622		

GREAT BROUGHTON.—For erecting two houses, for Mr. T. Kirkpatrick. Messrs. W. G. Scott & Co., architects and surveyors, 2, Park-lane, Workington:—
Builder, Joiner, Slater, and Plasterer: J. Twiname, Great Broughton £220 0
Plumber: J. W. Tickle, Cockermouth 13 15
Painter: T. D. Keenliside, Workington 16 15

GREAT BROUGHTON.—For erecting a house, for Mr. J. Tweedle. Messrs. W. G. Scott & Co., architects and surveyors, 2, Park-lane, Workington:—
Builder, Plasterer, and Slater: J. Twiname, Great Broughton £105 10
Joiner: T. Smith, Great Broughton 32 10
Plumber: D. M. Walker, Workington 6 0
Painter: T. D. Keenliside, Workington 6 0

HEMSWORTH.—For street works, for the South Kirkby, Featherstone, and Hemsworth Collieries, Ltd. Messrs. Garside & Pennington, surveyors, etc., Pontefract and Castleford. Quantities by surveyors:—
H. Roberts, Gainsborough* £2,201

HOUNSLOW.—For improvements and repairs at Spring-grove Infants' School and Heston Schools, for Heston and Isleworth Urban District Council Education Committee. Mr. A. L. Lang, Architect, Council House, Hounslow:—

Spring-grove Infants' Schools.

J. & W. Drake	£264 1 3	W. R. Gray, Heston*	£223 9 5
A. & B. Hanson	241 14 6		
W. Frost & Co.	248 0 0		

Heston Schools.

W. Frost & Co.	£23 0	W. R. Gray, Heston*	£17 16
A. & B. Hanson	18 3		

HULL.—For alterations and additions to the Blenkin-street School, for the Education Committee. Mr. J. H. Hirst, City Architect, Town Hall, Hull:—

Simpson & Son	£804 8 9	M. Harper	£728 12 0
G. Jackson & Son	777 19 6	F. Southern	699 2 9
T. Goates	740 0 0	F. Singleton*	659 15 8
G. Houlton & Son	735 0 0		

[All of Hull.]

LONDON.—For St. Joseph's R.C. schools, girls' home, soup kitchen, and refuge lavatory, Gun-street, Whitechapel, E. Mr. W. P. Ryan, C.E., architect, 1, Whittington-avenue, Leadenhall-street, E.C.:—

E. F. Heeps	£9,886 0 0	H. J. Williams	£7,857 0 0
J. G. Bellord	9,007 17 7	E. A. Roome & Co.	7,703 0 0
G. Keetch	8,990 0 0	Patman & Fotheringham*	7,653 0 0
Nowell & Lusty	8,432 13 7		
Holloway Bros.	8,200 0 0		
W. King & Sons	7,951 0 0		

MACCLESFIELD.—For erecting an infectious diseases hospital, Moss-lane, for the Corporation. Mr. C. W. Stubbs, Borough Engineer, Macclesfield. Quantities by Mr. Jabez Wright:—

J. Bradburn & Sons	£1,582 0 0	E. & A. Frith	£1,376 0 0
S. Bull	1,420 14 2	G. Simpson & Son*	1,216 15 0

[All of Macclesfield.]

NUNEATON.—For surface-water drain, etc., Abbey-street, for Nuneaton and Chilvers Coton Urban District Council. Mr. F. C. Cook, Surveyor and Engineer, Council Offices, Nuneaton:—

H. A. Barry	£848 6 1	A. Jewell	£696 7 10
J. Brown	768 14 9	J. H. Macdonald	692 0 0
G. Holloway	737 0 0	A. E. Palmer, Leicester*	677 9 1
J. T. Ball	733 0 0		
T. H. Harper	715 18 4		

PLYMOUTH.—For reinstatement of portion of workhouse damaged by fire, for the Guardians. Messrs. Thornely & Rooke, architects, 11, The Crescent, Plymouth:—
S. Roberts, Ltd., 81, Old Town-street, Plymouth* £3,098
[There were seventeen tenders, and the prices ranged from the amount of the accepted tender to £4,150, the highest.]

SUTTON-ON-SEA.—For bungalow, Sutton-on-Sea. Messrs. A. R. Calvert and William R. Gleave, architects:—
F. Moore* £787 10
[Lowest of four tenders.]

SWINDON.—For making alterations and additions at the White Hart Inn, Stratton Cross-roads, near Swindon, for Messrs. T. & J. Arkell. Messrs. Drew & Sons, architects, Regent-circus, Swindon:—

H. Looker	£258	H. Spackman & Co.	£213
Chick, Carden, & Co., Ltd.	235	Tydeman Bros., Swindon*	205

WIMBORNE.—For additions to Victoria Cottage Hospital, for the Committee of Management. Mr. Walter John Fletcher, architect:—

J. Smith	£314 5 0	H. Cobb, West Borough, Wimborne*	£255 14 3
Norman Bros.	272 14 9		

WINCHESTER.—For repairs at the Old Guildhall premises, for the Corporation. Mr. W. V. Anderson, City Engineer, Winchester:—
Coston & Co., Millbrook-road, Southampton. £229 9

WOLSTANTON.—For erecting new fire-station and rate collector's office, for Wolstanton United Urban District Council. Mr. W. F. Slater, architect and surveyor, Overhouse-chambers, Burslem:—

J. Grant	£862 0	S. Wilton, jun.	£721 0
G. A. Foster	836 0	J. Cooke	700 0
Price & Stretton	805 5	H. Wardle, Longport*	648 0
W. Grant & Son	790 0		
S. Heath	782 14		

WREXHAM.—For erecting new public elementary school for 1,000 scholars in Holt-road, for the Education Committee. Messrs. Burrell & Willey, architects, Durham. Quantities by architects:—
Davies Bros., Hill-street, Wrexham* .. £13,166 16 8

WREXHAM.—For the erection of the Alexandra Schools, for the Borough of Wrexham Education Committee. Messrs. Fredk. Willey & J. G. Burrell, joint architects, Durham. Quantities by architects:—
Davies Bros., Wrexham* £13,166 16 8

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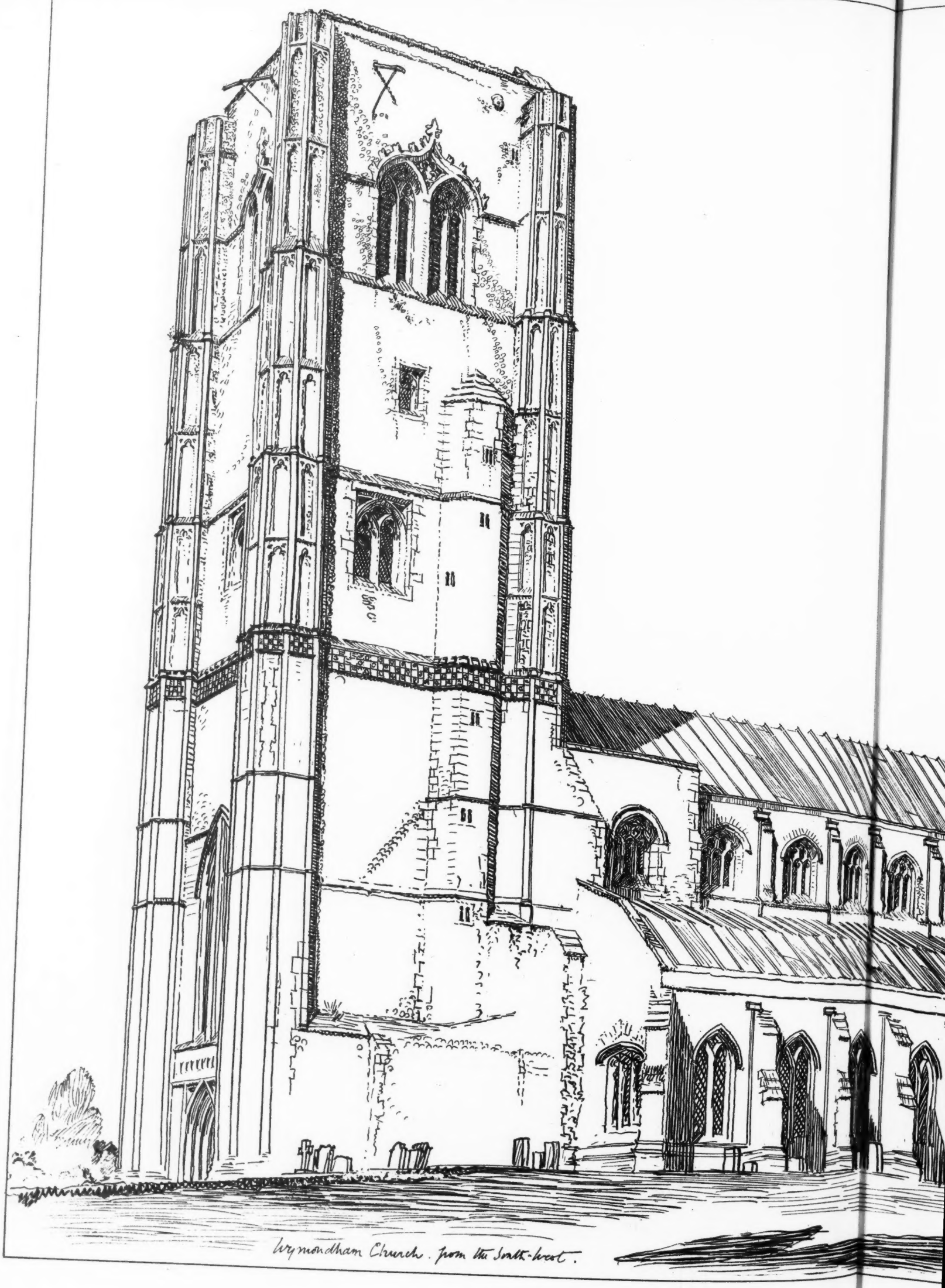

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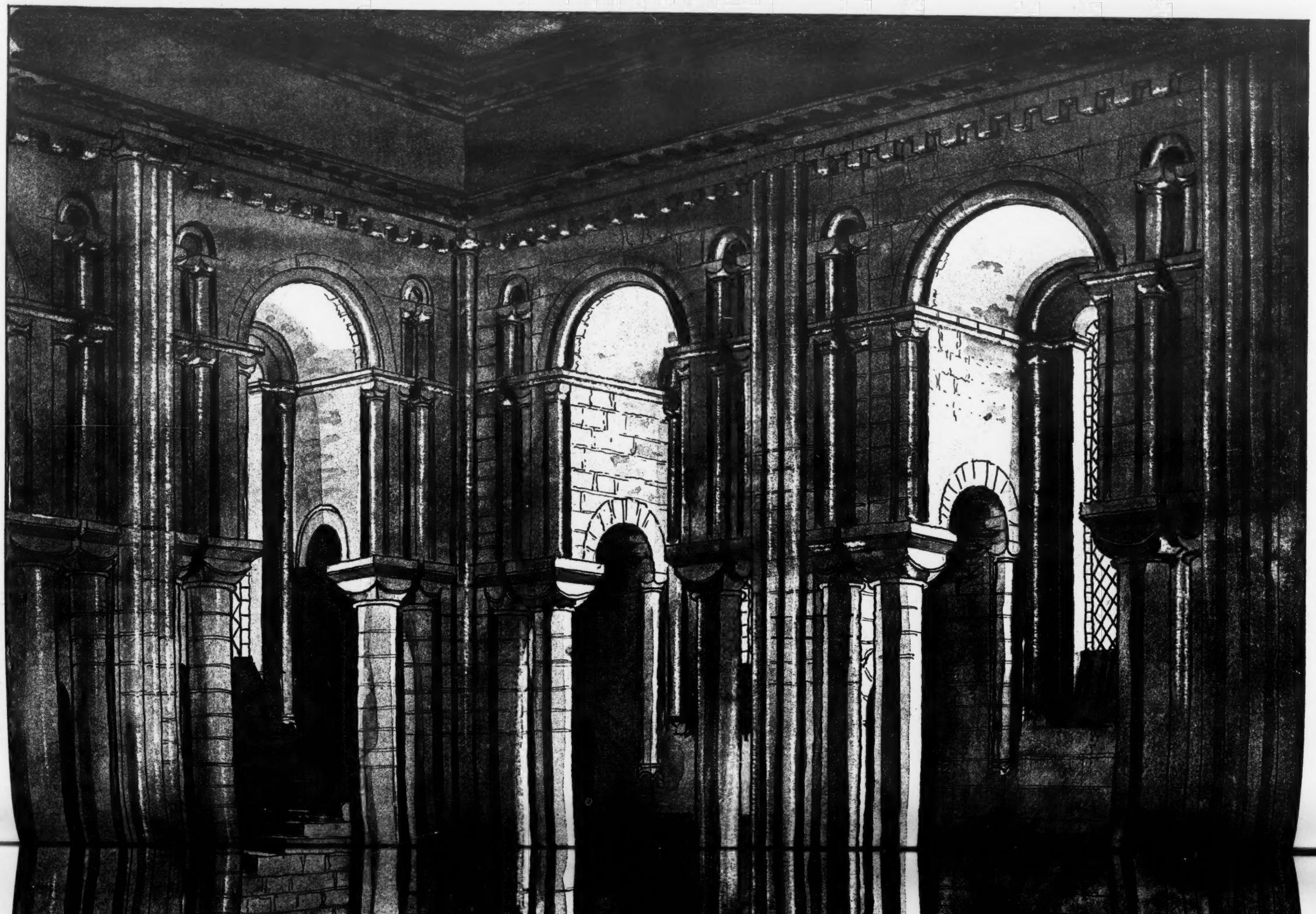

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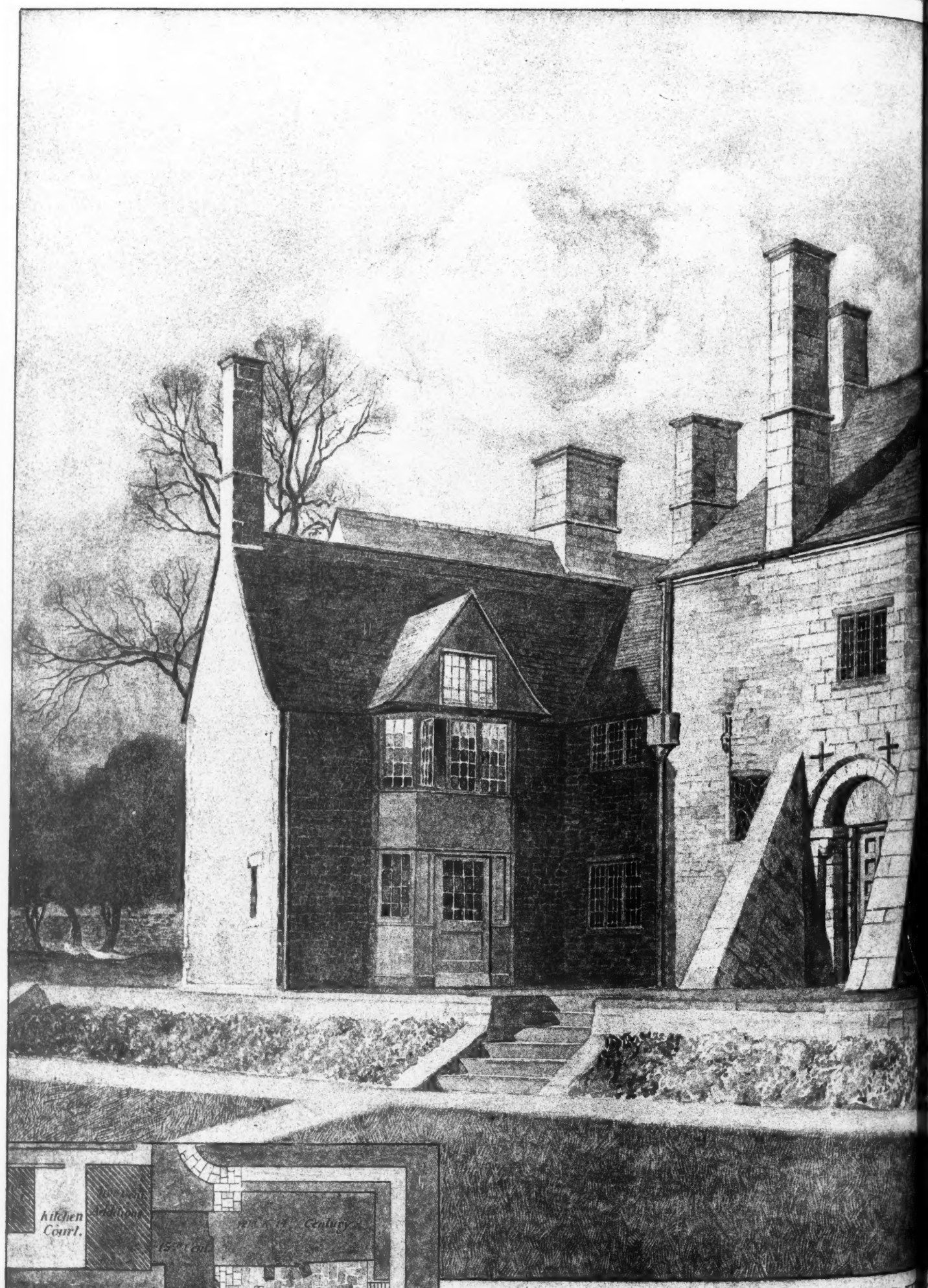

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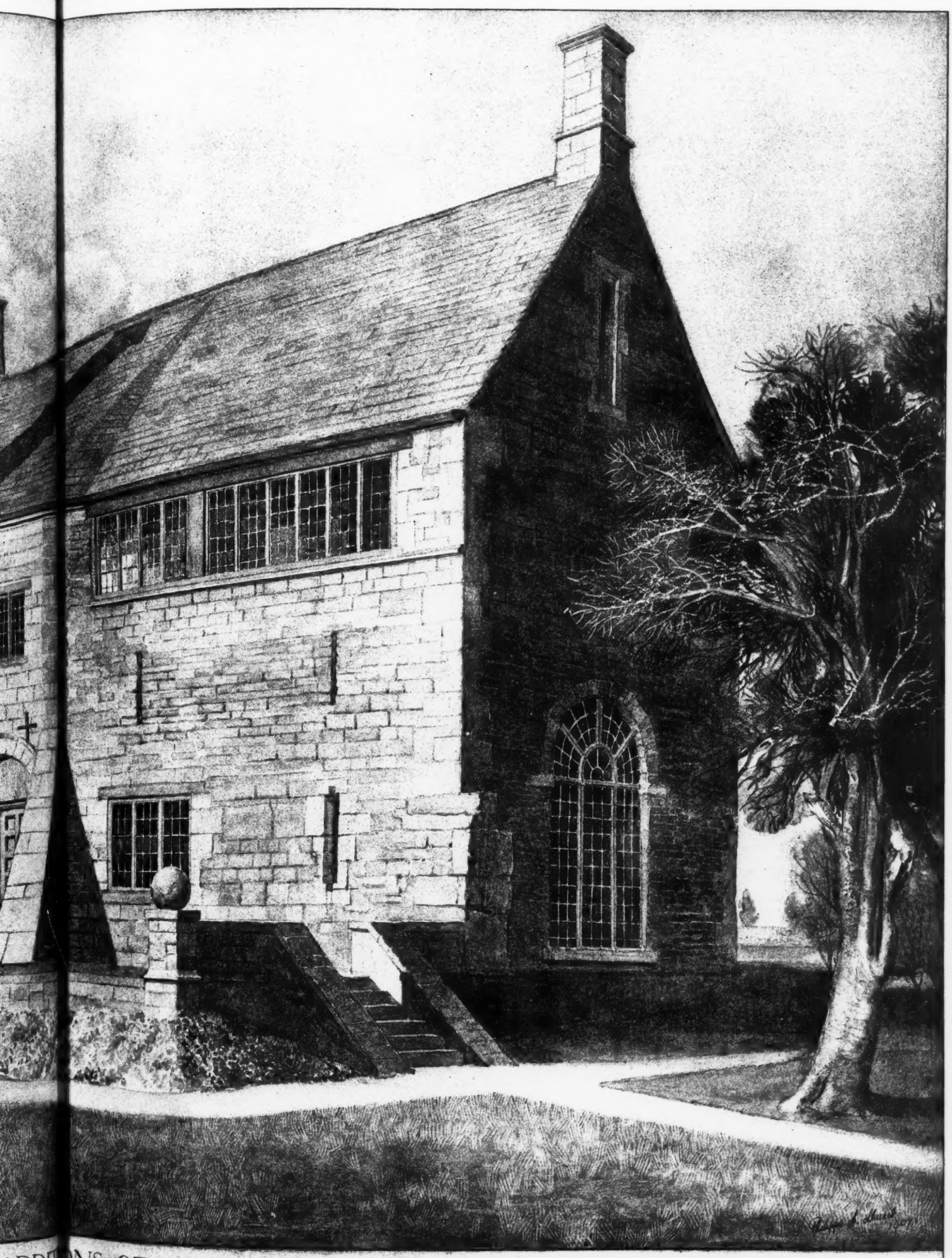

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